

**Some Phylloplane Fungi Associated with the
Freshly Fallen Leaves of *Michelia nilagirica* in
Hakgala Natural Forest**

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ABSTRACT. *Phylloplane* provides an excellent micro environment for many organisms, of which many are saprophytes. They have the ability to utilize organic compounds and minerals exuded from the leaves. In the present study, fungi were isolated from the freshly fallen fast decomposing leaves of *Michelia nilagirica* growing in Hakgala natural forest.

Of the 37 fungi isolated, 10 were identified as *Trichothecium roseum*, *Acremonium strictum*, *Penicillium citreonigrum*, *Broomella acuta*, *Cylindrocarpon didymum*, *Cylindrocarpon magusianum*, *Cylindrocarpon* sp., *Coelomycete* sp., *Herpotrichia striatispora* and a dark sterile sp. *Acremonium strictum* was isolated at the highest percent frequency and *Penicillium citreonigrum*, *Broomella acuta*, *coelomycete* sp. and *Herpotrichia striatispora* were isolated at the lowest percent frequencies.

The above isolated fungi are some of the numerous phylloplane fungi on the freshly fallen leaves of *Michelia nilagirica*.

INTRODUCTION

Michelia nilagirica which belongs to the family Magnoliaceae is one of the common tree species found in the lower elevation of Hakgala natural montane forest. According to Weerakkody (1994) the decomposition rate of the leaf litter of *Michelia* is very fast, i.e., *Michelia* leaves decomposed within 9–10 months forming net like structures with about 20% of mass remaining. The present study is being carried out to study the nature, biomass and activities of fungi associated with the decomposition of leaf litter of *Michelia nilagirica* as compared to slow decomposing leaf litter.

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Phylloplane provides a suitable habitat for many microorganisms including yeast and filamentous fungi (Gunasekera *et al.*, 1983) and these fungi present on the surface of the fallen leaves may play a major role in the decomposition process as the primary colonizers. Some of these fungi isolated from freshly fallen leaves of *Michelia nilagirica* are described.

MATERIALS AND METHODS

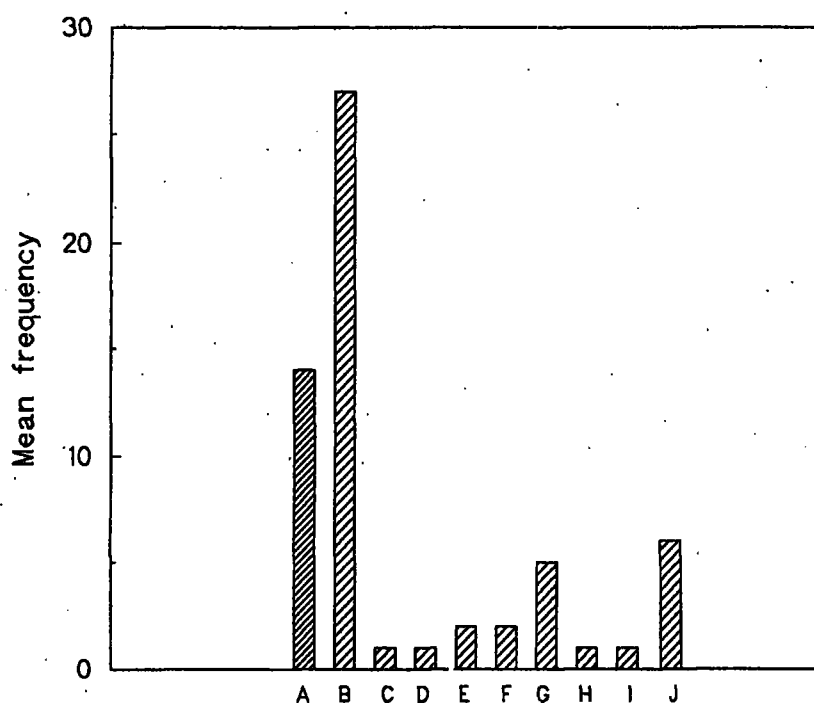
Five study plots (50 m × 50 m) were marked in the lower elevation of the Hakgala natural forest. Litter traps (6 m × 4 m) were set up under trees of *Michelia nilagirica* in each study area in order to collect replicate samples of freshly fallen leaves prior to them reaching the forest floor. These leaf samples (the total leaves collected from one study plot was considered as one sample) were taken to the laboratory in sterile polythene bags.

For isolating fungi, a modification of Harley and Waid (1955) serial washing technique was used. Twelve leaf discs (5 mm diameter) were removed from the leaves of each sample using a sterilized cork borer. These discs were then placed in 25 ml sterilized distilled water contained in a 100 ml screw-capped flask and washed by shaking at a speed of 300 rpm on a shaking platform (Gyrotory shaker, Model G2) for two minutes. Leaf material was washed 20 times repeatedly because the minimum number of washings required to eliminate the detachable propagules of surface contaminants from leaf discs, was estimated in a separated experiment as 20. The excess water was then removed from the discs using sterile filter papers and two small (1 mm) pieces of leaf were taken from each disc and were plated on 2% malt extract agar. The plates were incubated at room temperature for ten days. Fungi growing from the pieces of leaf were isolated into pure cultures and were identified by following the sticky tape method (Flegel, 1980) and preparing slide cultures. The frequency of occurrence (isolation) of each fungus was estimated as follows:

$$\text{Frequency} = \frac{\text{Number of leaf pieces colonized by the fungus}}{\text{Total number of leaf pieces examined}} \times 100$$

RESULTS AND DISCUSSION

Thirty seven species of fungi were isolated from the freshly fallen leaves of *Michelia*. Out of these, ten species were identified as *Trichothecium roseum*, *Acremonium strictum*, *Penicillium citreonigrum*, *Broomella acuta*, *Cylindrocarpon didymum*, *Cylindrocarpon magusianum*, *Cylindrocarpon* sp, *Coelomycete* sp, *Herpotrichia striatispora* and a dark sterile species. *Acremonium strictum* was isolated at the highest percent frequency and *Penicillium citreonigrum*, *Broomella acuta*, *Coelomycete* sp. and *Herpotrichia striatispora* were isolated at the lowest percent frequencies.



A - *Trichothecium roseum*, B - *Acremonium strictum*, C - *Penicillium citreonigrum*, D - *Broomella acuta*, E - *Cylindrocarpon didymum*, F - *Cylindrocarpon magusianum*, G - *Cylindrocarpon* sp., H - *Coelomycete* sp., I - *Herpotrichia striatispora*, J - Dark sterile sp.

Figure 1. Mean percent frequency of leaf surface fungi on freshly fallen *Michelia* leaves.

Some Phylloplane Fungi Associated with the Freshly Fallen Leaves

Before a leaf is shed, a considerable population of microorganisms including fungi is already well established on the leaf surface. Some of these organisms are parasitic meanwhile the others are saprophytic and live on material which is either exuded or which diffuses from the leaf (Burges, 1967). These leaf exudates contain water, minerals, simple sugars and other organic compounds (Ruinen, 1961). According to Domsch and Gams (1993), the fungi isolated in the present study have the ability to utilize the organic compounds; starch, pectin, xylan, cellulose and sugars, fructose, sucrose, maltose and glucose.

CONCLUSIONS

Trichothecium roseum, *Acremonium strictum*, *Penicillium citreonigrum*, *Broomela acuta*, *Cylindrocarpon didymum*, *Cylindrocarpon magusianum*, *Cylindrocarpon* sp., *Coelomycete* sp., *Herpotrichia striatispora* and dark sterile species are some of the numerous phylloplane fungi on the freshly fallen leaves of *Michelia nilagirica*. The mean percent frequencies of isolation of *Trichothecium roseum* and *Acremonium strictum* were higher than the other species.

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