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A NEW ANTIOXIDANT ACTIVE COMPOUND FROM THE ENDOLICHENIC FUNGUS, *PENICILLIUM CITRINUM* INHABITING THE LICHEN, *PARMOTREMA* SP.

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ABSTRACT: Context: Endolichenic fungi are the microorganisms living inside the thalli of the lichen and found to be a new source of bioactive secondary metabolites. This is an underutilized source of bioactive compounds and has not been studied extensively. Genus, *Parmotrema* is one of the foliose lichens with largely rounded lobes and occurs on rocks of rain forests, sub-montane and montane forests in Sri Lanka. **Aims:** The endolichenic fungi available in Sri Lanka and the chemistry of their secondary metabolites have not been explored thoroughly. This study aims at exploring novel bioactive compounds available in *Penicillium citrinum* inhabiting *Parmotrema* sp. **Methods and Material:** The lichen, *Parmotrema* sp., was collected from Hakgala Botanical Garden in Sri Lanka and its fungal strains were isolated and identified by Genomic DNA sequencing. Compounds were first extracted to ethyl acetate and subsequently subjected to bioassay-guided fractionation to isolate the bioactive compounds. The DPPH assay was used to determine the antioxidant activity. The active compound/s was separated by column chromatography, and its structure was elucidated by IR, 1D and 2D-NMR, ¹³C-NMR and MS. **Statistical Analysis Used:** The IC₅₀ of the crude extract was calculated using Probit analysis (MINITAB® Release 14.1. Minitab Inc. 2003 Statistical Software). **Results:** A bioactive compound, named PP-PC-03 together with PP-PC-01 and PP-PC-02 was isolated from *P. citrinum*. All three compounds showed antioxidant activity in the DPPH assay with IC₅₀ values 159.6 ± 22.3, 120.1 ± 11.7 and 68.6 ± 4.3 µg/mL respectively. **Conclusion:** Based on spectral analysis the structure of PP-PC-03 was determined as 10-Ethylidene-2,4,9-trimethoxy-10,10a-dihydro-7,11-dioxo-benzo[b]heptalene-6,12-dione and identified as a new compound. Comparatively PP-PC-02 and PP-PC-03 had moderate antioxidant activities while PP-PC-01 showed strong radical scavenging activity.

INTRODUCTION: Endolichenic fungi are microorganisms living in the thalli of lichens that are analogous to the plant endophytic species inhabiting the intercellular spaces of the hosts without causing deceptive damage to their hosts ¹.

The diversity and prevalence of endolichenic fungi have not been studied extensively, and there are only a few recorded studies available on isolation and identification of endolichenic fungi ¹⁻⁴.

The endolichenic fungi found in Sri Lanka and the chemistry of their secondary metabolites have not been explored thoroughly. The prevalence of endolichenic fungi in the lichens in Sri Lanka was published, and 29 endolichenic fungal strains have been isolated from the lichens, *Parmotrema* sp., *Usnea* sp. and *Pseudocyphellaria* sp. from Hakgala montane forest in Sri Lanka ².

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