

Chemical characterization of endolichenic fungi, *Talaromyces pinophilus* residing in the lichen, *Arthonia* sp. collected from mangroves of Sri Lanka

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Lichens are one of the interesting symbiotic organisms comprising of algae, fungi and other microbiota. The complex miniature ecosystem of lichen provides a competitive environment to endolichenic fungi, which makes it suitable for the production of structurally diverse molecules. Mangroves of Sri Lanka are well-known for the presence of various type of lichens and hence, in this study, 32 specimens of lichen were collected from mangroves of Puttalam Lagoon of Sri Lanka. LC-MS based dereplication study was carried out for the isolated 70 cultures of endolichenic fungi from lichens. Talaromin B and Ergochrome BB were present in the ethyl acetate extract of *Talaromyces pinophilus* along with probable novel compounds having m/z [M+H]⁺ 663.2321, 778.4128, 401.3029 with “no hit” in Dictionary of Natural Products (DNP). The mentioned extract showed promising anti-cancer activity having IC₅₀ of 50.32 µg/mL tested against MCF-7 cell line (Human breast cancer cell line) by Alamar blue assay. The extract was then scaled up for further isolation of masses showing no hits in DNP. Here, 2 known and 2 new compounds were isolated with 95-98% purity from the scaled up fermentation batch including [NIPER20099_83_7/30_1] Peniazaphilin B and a macrocyclicpolyester [NIPER20099_83_7/30_2] (15G25α). Structural elucidation of two novel molecules is in process. All four molecules were tested *in vitro* against MCF-7 cell line and only one molecule [NIPER20099_83_7/30_3] having molecular weight 560.2045 showed promising activity with the IC₅₀ value of 22.15µM. The study suggest *Talaromyces pinophilus* might serve as a source of novel cytotoxic hit. Investigating secondary metabolites of the endolichenic fungi might help us to unravel the complex ecosystems of lichen and help us understand its further therapeutic benefits.

Keywords: Lichen, Endolichenic fungi, *Talaromyces pinophilus*, Macrocyclic polyesters, Cytotoxic, Dereplication

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