

## 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]<sup>+</sup> 663.2321, 778.4128, 401.3029 with “no hit” in Dictionary of Natural Products (DNP). The mentioned extract showed promising anti-cancer activity having IC<sub>50</sub> 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 IC<sub>50</sub> 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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