



Identification of Novel Bioactive Compounds, Neurosporalol 1 and 2 from an Endolichenic Fungus, *Neurospora ugadawe* Inhabited in the Lichen Host, *Graphis tsunodae* Zahlbr. from Mangrove Ecosystem in Puttalam Lagoon, Sri Lanka

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Endolichenic fungi (ELF) have been recognized as a promising source of bioactive secondary metabolites. Sri Lanka, a biodiversity hotspot, harbours a remarkable diversity in mangrove ecosystems. In the present study, endolichenic fungi obtained from mangrove lichens of Puttalam lagoon were studied for their secondary metabolites. An endolichenic fungus, *Neurospora ugadawe*, isolated from the lichen host *Graphis tsunodae* Zahlbr. was identified up to the species level. Secondary metabolites of *N. ugadawe* were extracted into ethyl acetate and crude extract showed promising antioxidant and anti-inflammatory activities. Bioassay guided separation on silica gel column chromatography and preparative TLC were performed to isolate the bioactive pure compounds. Two novel bioactive pure compounds were identified as Neurosporalol 1 and Neurosporalol 2. Neurosporalol 1 showed the highest antioxidant activity compared with the positive control BHT. Further, this compound showed very low anti-inflammatory activity compared to that of the positive control aspirin. Neurosporalol 2 showed comparable antioxidant and moderate anti-inflammatory activities.

Keywords: Endolichenic fungus, *Neurospora ugadawe*, Neurosporalol 1, Neurosporalol 2, Bioactivities.

INTRODUCTION

Over the years, natural products have been documented to be of great importance to the health of individuals and communities. In many developing countries and rural communities, natural product based medicines have played an important role for many years in their primary health care. Natural product based medicines are not only the main resources of traditional medicines but most of the modern medicines have also been isolated or derived from plants, fungi, lichens and animals. World Health Organization (WHO) also has recognized that herbal medicines serve the health needs of about 80% of the world's population; especially for millions of people in the vast rural areas of developing countries [1]. It should be highlighted that therapeutic use of plants is as old as 4000-5000 B.C. and

Chinese used the first natural herbal preparations as medicines [1]. Natural product derivatives constitute as much as 25% of the total drugs in developed countries, while in fast developing countries such as China and India, the contribution is as much as 80% [2]. However, drug discovery using natural products is a challenging task. It constitutes several steps e.g. isolation of bioactive compounds from natural resources, chemical analysis, characterization and pharmacological investigation including animal testing. The success of these resources mainly depends on the search for the correct source of natural products and the process is more or less similar to finding a needle in a haystack [3]. However, natural product studies are inclining into microorganisms because they serve as treasures for bioactive compounds and unlike plants, microorganisms are easily cultured on selective media. With slight modifications in culture media