

### Dr. C L de Silva Gold Medal Award

Awarded for an outstanding research contribution in any branch of Chemical Sciences and/ or the use of such research for National Development during the last five (5) years in Sri Lanka. Credit will be given for the utilization of local raw materials, and where the contribution has already resulted in (i) a publication in a Citation Indexed Journal or (ii) registering a Patent or (iii) where the contribution has already resulted in a positive impact in the development and innovation in the industry.

#### Dr. C. L. De Silva Gold Medal Award - 2021



**Prof. Lalith Jayasinghe** obtained his BSc. (Hons) in Chemistry in 1985 and PhD in Natural Products Chemistry in 1992, from the University of Peradeniya, and was awarded a Diploma in Natural Products Chemistry by the Tokyo Institute of Technology, Japan in 1994. He has served as a Visiting Scientist at the Tokyo Institute of Technology, Japan, University of Mississippi, USA, and University of Milan, Italy, and as a Visiting Professor at the Tokyo Institute of Technology and Meiji University, Japan. He was an Alexander von Humboldt Research Fellow at the University of Hohenheim, Stuttgart and

Jacobs University Bremen, Germany, and has held the IPICS Fellowship at University of Karachi, Pakistan and UNESCO-Monbusho Research Fellowship.

Prof. Jayasinghe has 94 scientific publications to his name, alongwith 3 book chapters and 280 communications, and has an h-index of 23 with 1887 citations. His research interests include investigation of extracts from plant sources and, epiphytic and endophytic fungi, for use in agriculture and human health, chemistry and bioactivity of edible fruits, plant secondary metabolites and LC-MS profiling of bioactive extracts. He is the recipient of numerous awards including the Kandiah Memorial Award of the Institute of Chemistry Ceylon in 1992, TWAS-NARASA Young Scientist Award in 1992, SUSRED Award of NSF in 2017 and eight Presidential Awards for scientific publications.

He is currently serving as a Senior Research Professor at NIFS, Kandy, Sri Lanka.

#### Abstract of Dr. C L de Silva Gold Medal Award - 2021

### Search for Bioactive Compounds from Sri Lankan Medicinal Plant and Endophytic Fungi

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Natural Products are compounds produced by living organisms found in nature. These can be used to improve the quality of human life. Over 3500 flowering plants, including ~800 endemics, are inhabiting Sri Lanka, of these only a relatively low number of plants have been chemically and biologically investigated. The country's native fungal flora is around 25,000 and a vast majority remains to be studied for bioactive metabolites. Our recent findings of natural products with biological

active from medicinal plants and endophytic fungi are presented here.

Inhibition of pancreatic lipase is an attractive approach for treatment of diet-induced obesity. Activity-guided isolation of pancreatic lipase inhibitors from the methanol extract of *Trigonella foenum-graecum* seeds furnished vicenin-1 (1), isoschaftoside (2), schaftoside (3) and trigonelline (4). These compounds, at 250 µg/

ml, inhibited lipase activity at 60.3% (1), 33.8% (2) and 95.5% (3). This is the first report of lipase inhibitory active metabolites from *T. foenum-graecum*.

*Biscogniauxia capnodes*, an endophytic fungus isolated from the fruit of *Averrhoa carambola*, produced *in vitro* two isocoumarins, reticulol (5) and 6-O-methyl-reticulol (6), and two dihydroisocoumarins, 5-methylmellein (7) and 7-hydroxy-5-methylmellein (8). The compound 5 showed antioxidant activity. This is the first report of isolation of *B. capnodes* as an endophyte, as well as the compounds 5 - 8 from *B. capnodes*.

Metabolites of *Colletotrichum siamense*, isolated from *Piper nigrum*, furnished antifungal indole-3-acetic acid (IAA) (9) and uracil (10), while those of *Phialemonium curvatum* from the leaves of *Passiflora edulis* yielded 3-indole acetic acid (9), uracil (10), 4-hydroxybenzoic acid (11), solaniol (12), uridine (13) and glycerol (14). The absolute stereochemistry of solaniol (12) and the complete <sup>13</sup>CNMR were assigned. *Neofusicoccum parvum* was isolated as an endophyte from fruits of *Elaeocarpus serratus*. Chromatographic separation of the ethyl acetate extracts furnished (*R*)-7-hydroxymellein (15), (3*R*,4*R*)-4-hydroxymellein (16), (3*R*,4*S*)-4-hydroxymellein (17), (*R*)-5-hydroxymellein (18), (*R*)-mellein (19), (3*R*,4*R*)-4,7-dihydroxymellein (20), (6*R*,7*S*)-dia-asperlin (21), CJ-14445 (22) and 13,14,15,16-tetranorlabd-7-ene-19,6β:12,17-diolide (23). This is the first report of the

isolation of an endophytic fungus from *E. serratus*, and the compounds 15, 18, 20, 22 and 23 from *N. parvum*. It is important to note that 15 - 21 are smaller molecules with an oxygen heterocyclic ring system which is significant in organic synthesis.

Fermented culture filtrates of *Talaromyces purpurogenus* from *Pouteria campechiana*, upon chromatography, furnished a new furanone analogue of talaroconvolutin A, named talarofuranone (24), along with talaroconvolutin A (25), 4-hydroxyacetophenone (26), tyrosol (27) and ergosterol (28). Compound 25 responded positively to brine shrimp lethality assay and shoot and root growth assay for lettuce seeds. *Pestalotiopsis microspora* was isolated from *Manilkara zapota* and the EtOAc extract of its culture filtrate and the mycelium led to the isolation of a new azaphilonoid named pitholide E (29), in addition to previously identified pitholide B (30), pitholide D (31), pestalotin (LL-P880α) (32), PC-2 (33), LL-P880β (34), tyrosol (27) and 4-oxo-4*H*-pyran-3-acetic acid (36). Isolation of compounds, 29-33, 35 and 36, from *P. microspora* was reported for the first time. These results explain the potential of higher plants and endophytic fungi as excellent sources of bioactive compounds.

**Keywords:** Medicinal plants, Endophytic fungi, Bioactivity, Lipase inhibitor