Isolation of a potential anti-cancer compound from *Mangifera zeylanica* leaves and investigation of its effects

AADN Perera [1], SR Samarakoon [1], MK Ediriweera [2], KH Tennekoon [1]

[1] Institute of Biochemistry Molecular Biology and Biotechnology, University of Colombo

[2] Department of Biochemistry and Molecular Biology, Faculty of Medicine, University of Colombo

Lung cancer has been estimated to cause the highest number of cancer deaths in 2023. Of two subtypes of lung cancer, Non-Small Cell Lung Cancer (NSCLC) is the most frequently reported. Currently used treatment options for NSCLC are chemotherapy, radiotherapy and surgery. However, chemo- and radio- therapies result in severe side effects. Therefore, invention of new treatment strategies for NSCLC is timely needed. Investigations on plant derived compounds is becoming a promising approach for discovering potential anti-cancer drug leads. *Mangifera zeylanica* (family: Anacardiaceae) is a plant endemic to Sri Lanka and used for cancer treatment in traditional medicine. We have previously reported that the chloroform extract of *M. zeylanica* leaves is cytotoxic to non-small cell lung cancer cells (NCI-H292) with less cytotoxicity to normal lung fibroblasts. In the present study we isolated an active compound (B-II-c-a) from the chloroform extract using silica-gel column chromatography, size exclusion chromatography and reversed phase preparative high performance liquid chromatography. Cytotoxicity of B-II-c-a on NCI-H292 cells was evaluated using Sulforhodamin B (SRB) assay. The effects of B-II-c-a on cell migration and colony formation was investigated using wound healing assay and colony formation assay respectively. Assessment of potential apoptotic effects of B-II-c-a was carried out using Ethidium Bromide/Acridine Orange (AO/EB) staining. The compound B-II-c-a showed cytotoxic effects on NCI-H292 NSCLC cells and MRC-5 normal lung fibroblast cells following 24h exposure (IC_{50} of 3.22 µg/mL and 7.83 µg/mL respectively). Moreover B-II-c-a resulted in inhibition of colony formation and cell migration. AO/EB staining revealed that B-II-c-a induces apoptosis in NCI-2H92 cells. Structure determination of B-II-c-a is currently in progress.

Keywords: SRB assay; Non-Small Cell Lung Cancer; anti-cancer

This work was supported by the Ministry of Science, Technology and Research, Sri Lanka (Grant No: MSTR/TRD/AGR/3/02/08) *and constitutes a part of the PhD studies of PAADN.*