

## **Momordica charantia (Indian and Chinese bitter melon) extracts inducing apoptosis in human lung cancer cell line A549 via ROS-mediated mitochondria injury**

### **ABSTRACT**

Lung cancer is the leading cause of cancer related deaths worldwide with about 40% occurring in developing countries. The two varieties of *Momordica charantia*, which are Chinese and Indian bitter melon, have been subjected to antiproliferative activity in human non-small cell lung cells A549. The A549 cells were treated with hot and cold aqueous extraction for both the bitter melon varieties, and the antiproliferative activity was evaluated by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. The apoptotic mechanism of action on A549 human lung cancer cells was evaluated first morphologically using Hoechst 33358, and cytoskeleton staining using Filamentous-actin (F-actin) cytoskeleton FICT and DAPI followed by caspase-3/7, reactive oxygen species (ROS), and p53 activity. Chinese hot aqueous extraction (CHA) exhibited potent antiproliferative activity against A549 human lung cancer cells. The morphological analysis of mitochondria destruction and the derangement of cytoskeleton showed apoptosis-inducing activity. CHA increased the caspase-3/7 activity by 1.6-fold and the ROS activity by 5-fold. Flow cytometric analysis revealed 34.5% of apoptotic cells significantly ( $p < 0.05$ ) compared to cisplatin-treated A549 human cancer cells. CHA is suggested to induce apoptosis due to their rich bioactive chemical constituents. These findings suggest that the antiproliferative effect of CHA was due to apoptosis via ROS-mediated mitochondria injury.