

Apoptosis Inducing Potential of *Onosma Bracteata* Wall. in Mg-63 Human Osteosarcoma Cells via cdk2/Cyclin E Pathway

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Abstract : *Onosma bracteata* Wall. (Boraginaceae), is known to be a medicinal plant, useful in the treatment of body swellings, abdominal pain and urinary calculi, etc. The present study focused on the radical scavenging and cancer growth inhibitory properties of isolates from *O. bracteata*. Obea fraction demonstrated noticeable free radical scavenging ability along with antiproliferative activity in human osteosarcoma MG-63, human neuroblastoma IMR-32, and human lung cancer A549 cell lines using MTT assay with GI50 values of 88.56, 101.61 and 112.7 µg/ml, respectively. The scanning electron and confocal microscopy studies showed morphological alterations including nuclear condensation and formation of apoptotic bodies in osteosarcoma MG-63 cells. Obea fraction in osteosarcoma MG-63 cells augmented the reactive oxygen species (ROS) level and decreased the mitochondrial membrane potential. Flow cytometry analysis revealed the Obea treated cells to be arrested in the G0/G1 phase in a dose dependent manner supported by the observed increase in the early apoptotic cell population. Western blotting analysis showed that the expression of p-NF-kB, COX-2, p-Akt, and Bcl-xL decreased whereas, the expression of GSK-3β, p53, caspase-3 and caspase-9 proteins increased. The downregulation of Bcl-2, Cyclin E, CDK2 and mortalin gene expression and upregulation of p53 genes was unfolded in RT-qPCR studies. The presence of catechin, kaempferol, Onosmin A and epicatechin, as revealed in high-performance liquid chromatography (HPLC) studies, contributes towards the chemopreventive potential of *O. bracteata* which can be tapped for chemotherapeutic use.

Keywords : apoptosis, confocal microscopy, HPLC, mitochondria membrane potential, reactive oxygen species

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