ABSTRACT

Prostate cancer (PC) ruins a foremost cause of death in males of the USA as well its growth rate is increased in the rest of the world. Prostate cancer is one of the diseases worldwide that causes cancer-related deaths in men. Prostate cancer is the most common cancer in American men. The American cancer society's estimates for Prostate cancer in the USA for 2017 are about 161,360 new cases of Prostate cancer, about 26,730 deaths from Prostate cancer. The prostate is the second leading site of cancer among males in large Indian cities like Delhi, Kolkata, and Pune. The isolation of Taraxerol and Reticulatacin from the bark of *Annona reticulata* after successive extraction with petroleum ether, chloroform, and ethanol was performed. The preliminary phytochemical screening was analyzed reported by spectroscopic techniques by Thin Layer Chromatography (TLC) and conforming the above constituents by High-Performance Liquid Chromatography (HPLC), Ultra Violet (UV) techniques. Structural elucidation was carried by ^{1}H Nuclear Magnetic Resonance, ^{13}C Nuclear Magnetic Resonance and Gas Chromatography-Mass Spectrometric (GC-MS). The possible effect of Taraxerol and Reticulatacin on *in-vitro* and *in-vivo* study was investigated. *In-vitro* study was carried on LNCaP and PC-3 cell lines were cultured and cytotoxicity effect was recorded by MTT method and Neutral red assay. Measurement of Lactate Dehydrogenase release and determinations of apoptosis by Acridine Orange (AO) and Ethidium Bromide (EB) double staining techniques was analysed. *In-vivo* studies followed by healthy adults male Wistar albino rats were divided into seven groups (n = 8). Group I was served as vehicle control (Arachis oil 1 ml/kg, s.c), group II was served as Testosterone Depot (TD) injection (3 mg/kg, s.c in Arachis oil), group III was served as standard Finasteride (5 mg/kg, p.o), group IV was served as treated with Taraxerol (50 mg/kg p.o), group V was served as treated with

Taraxerol (100 mg/kg p.o), group VI was served as treated with Reticulatacin (50 mg/kg p.o), group VII was served as treated with Reticulatacin (100 mg/kg p.o), for 28 days to assess cancer preventive effect of Taraxerol and Reticulatacin. At the end of the treatment animal was sacrificed and the Prostate tissue was removed and homogenized. Biochemical parameters like Malondialdehyde (MDA), Glutathione Peroxidase Activity (GPx), Glutathione Reductase (GR), Reduced Glutathione (RG), Catalase (CAT), Protein levels, Histopathological changes were observed and RT-PCR analysis of TNF-α Expression by isolation of Total RNA method was performed. Inhibition of Protein Denaturation, Caspase levels and DNA fragmentation was performed. Phytochemical investigation summary on the bark of *Annona reticulata* was reported. Presence of flavonoids, tannins, triterpenoid, and acetogenins was conformed in the extract. *In-vitro* experiments show the isolated compounds exhibited of cytotoxicity against the cancer cell lines. An increase in caspase levels is generally considered as indicators of cellular apoptosis. *In-vivo* study revealed the antioxidant property.

KEYWORDS:

Taraxerol, Reticulatacin, MTT assay, Lactate Dehydrogenase assay, DNA Fragmentation, Caspase-3, Caspase-7, Acridine Orange, Ethidium Bromide, Prostate Cancer, Testosterone Depot, Lipid Peroxidation, Reduced Glutathione, Glutathione Peroxidase, Histopathology.