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## Basella rubra, a natural chemopreventive agent against colon cancer: An outbreak in health care

Josthna Penchalani<sup>1</sup>, Bhanu Priya K<sup>1</sup> and Venkata S Kotakadi<sup>2</sup><sup>1</sup>Sri Padmavathi Mahila University, India<sup>2</sup>Sri Venkateswara University, India

The present study deals with the exploration of traditionally used plant (*Basella rubra*) against colon cancer. Aqueous leaf extract of *Basella rubra* were studied for chemotherapeutic potential against chemically induced carcinogenesis model. Chemopreventive effect of BRAE (*Basella rubra* aqueous extract) is evidenced by the decreased incidence and distribution of tumors along the colon with reduction in number of ACF and AgNOR count. Immunohistochemistry findings demonstrated that BRAE significantly inhibited the growth of cancer cells by inhibiting cell proliferation and by inducing apoptosis through activation of apoptosis pathway which is cleared by the increased expression of apoptosis markers (p53 & Caspase-3) and decreased expression of cell proliferation markers (PCNA & Ki67). Plants are known to be rich in a number of bioactive compounds, which have demonstrated to possess numerous therapeutical activities. This research arose from the interest to identify the potential active anti-carcinogenic compounds and characterize their effects on proliferation and cell death in colon cancer (HT-29) cell lines. This makes the isolation, identification of bioactive compounds for a specific biological activity and structural determination of active compound. Bioactive compound (BR-1) was identified by MTT assay and the compound (BR-1) was identified as flavonoid group of compound by chemical screening. Based on the results from spectral analysis (UV, IR, MS and NMR), the active compound (BR-1) was tentatively identified as Isovitexin with the molecular formula coined as C<sub>21</sub>H<sub>20</sub>O<sub>10</sub>. The effect of Isovitexin on the anti-proliferative and cytotoxic effects against HT-29 human colon cancer (HT-29) cells was assessed by the MTT and LDH assays. A significant decrease in cell viability and increased in cell death was observed with increasing concentrations of Isovitexin. The results showed that IC<sub>50</sub> of Isovitexin was found to be 21.44 µg/ml concentrations on HT-29 cell line. Induction of apoptosis by Isovitexin was supported with evidence of DNA fragmentation. At the same time, apoptosis-related proteins such as Bax, Bcl-2, pro-caspase-3, and active caspase-3 expression were determined by western blot analysis. The HT-29 cells were treated with Isovitexin for 0-24 h. An increase in expression of the Bax, which led to an activation of caspases-3 and a decrease in expression of the anti-apoptotic factor Bcl-2 were observed in a time-dependent manner. Isovitexin could also down-regulate the expression of pro-caspase-3 in a time-dependent manner. Our results evaluating the molecular mechanism that Isovitexin induced apoptosis cell death in HT-29 cells may occur via caspase-3, through mitochondrial dependent pathway. Hence, these findings support and strengthen the anticancer activity possessed by the Isovitexin and it might be used as a good chemotherapeutic approach against colon cancer. Thus overall study reports the potential usefulness of *B. rubra* as a chemopreventive agent.

### Biography

Josthna Penchalani is currently working as an Assistant Professor at the Department of Biotechnology, Sri Padmavathi Mahila University, Tirupati, India.

[penchalajyo@yahoo.co.in](mailto:penchalajyo@yahoo.co.in)

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