PRECLINICAL USE OF *VERNONIA AMYGDALINA* AS DNA DAMAGING ANTI-CANCER AGENT IN THE MANAGEMENT OF BREAST CANCER

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**Abstract:** Breast cancer is the leading cause of death among women between 40 and 55 years of age and is the second overall cause of death among women. Fortunately, the mortality rate from breast cancer has decreased in recent years due to an increased emphasis on early detection and more effective treatments. Despite early detection, conventional and chemotherapeutic methods of treatment, about 7% of women still died every year. Hence, the aim of the present study was to test the therapeutic efficacy of *vernonia amygdalina* leaf extract as DNA damaging anti-cancer agent against human breast cancer *in vitro* using the MTT [3-(4, 5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide] and alkaline single cell gel electrophoresis (Comet) assays, respectively. In this experiment, human breast adenocarcinoma (MCF-7) cells were treated with different doses of *vernonia amygdalina* leaf extract for 48 hours. Data obtained from the MTT assay indicated that *vernonia amygdalina* slightly reduced the viability of MCF-7 cells in a dose-dependent manner upon 48 hours of exposure. Data generated from the comet assay also indicated a slight dose-dependent increase in DNA damage in MCF-7 cells associated with *vernonia amygdalina* treatment. We observed a slight increase in comet tail-length, tail arm and tail moment, as well as in percentages of DNA cleavage at all doses tested, showing an evidence *vernonia amygdalina*-induced minimal genotoxic damage in MCF-7 cells. Taken together, our findings suggest that *vernonia amygdalina* treatment moderately (P < 0.05) reduces cellular viability and induces minimal DNA damage in MCF-7 cells. These findings provide evidence that *Vernonia amygdalina* represents a DNA-damaging anti-cancer agent against breast cancer and its mechanisms of action functions at least in part through minimal DNA damage and moderate toxicity in tumors cells.

**Keywords:** *Vernonia amygdalina*, MCF-7 cells, cytotoxicity, genotoxicity, DNA damage

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