MARKERS FOR *VERNONIA AMYGDALINA* EXTRACTS ANTI-CANCER ACTIVITY

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Abstract: Botanical supplements (BS) usage has surged globally. In the United States, it is estimated that more than 60 million Americans use BS, which cost them more than $600 million annually. The growing popularity of botanical usage is also accompanied by quality control, safety, and efficacy concerns. Although, emerging evidence continues to support the health benefits of botanicals, analyses which determine the amount of pharmacologically-relevant substances contained within different commercial BS, reveal a wide range of variation. Therefore, there is a need to standardize botanical products. Other challenges facing both the BS industry and consumers are production or access to an authenticated, contaminants-free BS, without undesirable and potentially harmful substances. Aqueous leaf extracts of *Vernonia amygdalina* (VA), a Nigerian edible plant have been shown to inhibit the proliferation of estrogen receptor positive (ER+) human breast carcinoma cells in vitro. The possibility of VA usage as BS in the near future is relatively high, and there are no activity markers to determine high quality and potency of unadulterated VA leaves or extracts. Hence, the objective of this study was to assess the chemical profile for VA using extraction, chromatographic, and spectroscopic techniques. Bioassay-guided fractionation of the VA extracts resulted in fractions (4, A-2, A-3, B-2, B-3 and B-4) that were required for VA anti-proliferative activity in MCF-7 breast cancerous cells. Further analyses of the fractions by \(^1\)H- and \(^13\)C-NMR techniques revealed the presence of aromatic and aliphatic groups. Quantitative characterization of these fractions by LC-MS is currently under investigation. These data suggest that both the presence and quantities of these fractions are important for VA activities. Thus, these fractions may be used as markers to predict VA activity.

Keywords: *Vernonia amygdalina*, activity markers, anti-cancer, MCF-7

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