

INHIBITION OF LEPTIN SECRETION BY *VERNONIA AMYGDALINA* EXTRACT

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Abstract: Obesity is the second leading cause of preventable deaths in the USA and is a significant risk factor in a number of diseases including hypertension, hypercholesterolemia, adult onset diabetes, strokes, certain cancers, cardiovascular disease and other medical problems; and has an adverse effect on longevity. Obesity is characterized by an increase in the size of lipid stores in adipocytes derived from pre-adipocytes (3T3-L1 cells). Leptin, a 167-amino acid product of the *ob* gene, is synthesized primarily in adipocytes and is a major regulator of fat and energy storage due to its effect on the hypothalamus. The edible Nigerian plant, *Vernonia amygdalina* (VA) has been shown to cause a plethora of beneficial effects including lowering both fasting and blood glucose levels, A1C levels, and lipid levels, without any harmful side effects. Data from this study reveal that treatment with low concentrations of the aqueous extracts of leaves from VA reduces the amount of leptin in 3T3-L1 adipocytes grown in Dulbecco's Modified Eagle's Medium supplemented with 10% fetal bovine serum and 1% penicillin-streptomycin. Untreated (no VA extract-control) or 3T3-L1 adipocytes treated with 20, 40, 60, or 80 ug/mL VA extracts were cultured for 24 hours and the quantitative measurement of leptin in 3T3-L1 cell culture was obtained using an *in vitro* enzyme-linked immunosorbent assay. We show that VA extracts significantly reduced the secretion of leptin in adipocytes in a dose-dependent manner, with the best effects observed at 60 mg/mL concentration ($P < 0.5$). This study demonstrates that VA extracts decreases the secretion of leptin in adipocytes *in vitro*, suggesting that VA extracts may be successful in managing leptin homeostasis. Our findings suggest that VA extracts may have efficacy toward reducing overall fat accumulation in growing animals and contribute to a greater understanding of molecular targets affecting obesity, thus potentially impacting the obese.

Key Words: Obesity, *Vernonia amygdalina*, 3T3-L1 cells, adipocytes, leptin.