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DOI: 10.2478/auoc-2025-0010

**Ovidius University Annals of Chemistry** Volume 36, Number 1, pp. 86 - 90, 2025

# Chemical composition, nutritional profile, and antioxidant potential of *Vernonia amygdalina*

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**Abstract.** The leaf of *Vernonia amygdalina* has been a known vegetarian food and medicinal plant used in Asia and Africa (West Africa) due to its observed pharmacological effects (antioxidant, antidiabetes, anti-inflammatory, anticancer, antimalaria, and among others). The present work investigated the leaf (proximate) and leaf extracts of two species of the plant (local and the hybrid species) and presented a comprehensive comparative qualitative and quantitative phytochemical screening, proximate (leaf) and vitamins analyses, antioxidant properties, and GC-MS and FT-IR characterization of the leaf extracts. The phytochemical results revealed the presence of tannin, alkaloid, flavonoid, saponin, glycoside, sterols and phenols in both local and hybrid species. The quantitative phytochemicals analysis revealed high content of alkaloids (51.3 mg/g), followed by flavonoids (44.3 mg/g) and saponins (34.7 mg/g). The antioxidant activity study showed values of 7.85±1.02 µM TE for CUPRA (Cupric Reducing Antioxidant Capacity) and 7.77±1.10 µmol Trolox/g for FRAP (Ferric Reducing Ability of Plasma). The GC-MS analysis revealed the presence of thirty-five bioactive compounds in both species, and the most applicable include 9, 12, 15-octadecatrien-1-ol, *n*-hexadecanoic acid, octadecatrienol acid, methyl palmitate, and phytol. The FT-IR results revealed the presence of functional groups consistent with O-H, C=O and C-H bonds in the methanol extracts of the plant. In the proximate study, the moisture content, ash content, crude fiber, fat content, crude protein and carbohydrate content were 33.15±0.03, 9.32±0.01, 11.83±0.02, 5.78±0.01, 9.13±0.01, and 30.79±0.02 %, in the local species, and 52.55±0.11, 6.76±0.03, 8.23±0.01, 6.54±0.21, 12.68±0.52, and 13.24±1.22 % in the hybrid species respectively. The vitamin analyses of the local species showed the highest amount of vitamin C while the hybrid species showed the highest amount of vitamin E. Antioxidant studies showed that the local species exhibited the highest antioxidant properties while the hybrid species showed highest antioxidant properties and the values for $H_2O_2$ scavenging ability of the species were 1.92±0.01 and 1.59±0.01 respectively. On a proximate basis, the hybrid showed a higher level of crude proteins and less carbohydrates.

***Keywords*:** *Vernonia amygdalina*; phytochemicals; vitamins; antioxidant; GC-MS and FT-IR characterization.

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