

Vernonia amygdalina leaf and antioxidant potential

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Introduction

Vernonia amygdalina is a member of the daisy family (Compositae or Asteraceae); it is mostly grown in tropical Africa and Asia. It is a member of Kingdom Plantae; angiosperm of species is classified as genus *Vernonia* that comprises around 1000 species.¹ *Vernonia* genus had been named in the honor of William Vernon who was a plant collector and botanist from North America in the 17th century.² This plant is also called ironweed with a soft-wooded shrub that can regenerate rapidly. Characteristically, it can produce an enormous mass of forage that is drought tolerant and can grow rapidly with regeneration potential.³ This plant can grow to a height of about 1–6 m above sea level with elliptical shaped petiolate leaves of 6 mm diameter and 20 cm long.^{4,5} The branches with brownish or gray color, flaked and roughed in texture can easily be detached off (Fig. 1). Aside from these characteristics, this plant possesses greenish leaves; the flowers are whitish, tiny, and small. *V. amygdalina* is mostly seen along drainages, natural forests, home gardens, and commercial plantations.^{3,5–7} It has been named “bitter leaf” in English because of its bitter taste. However, different ethnics around the universe have assigned different names to this multifunctional plants, which include Nigeria (Fatefata, ewuro, etidot, chusar doki, onugbu, ityuna, mululuza, omubirizi, and oriwo); Ethiopia (ebichaa); Ghana (awonwono); Rwanda (umubilizi); Togo (gbondutsi and aluma), Cameroon (ying and ndoleh); Guinea (kossa fina, bantara bururé and Dakuna); Malaysia (poko African Selatan, South Africa leaves and daun bismillah); Kenya (olulusia); Democratic Republic of São Tomé and Príncipe (libo que and libo mucambu); and several other countries that grow this plant.^{3,5,8} *V. amygdalina* is a multipurpose plant with several purposes; this plant can rapidly regenerate and grow. Some of the multipurpose nature of *V. amygdalina* includes the usage in traditional medicine against different infections, digestive system stimulant, yam sticks in the villages, and fence post.

This plant is mostly grown in a home garden, natural forests, commercial plantations, and drainage lines.³ Additionally, *V. amygdalina* is a drought-tolerant plant that can germinate under a range of ecological zones. This specific species is indigenous to tropical Africa and planted all over sub-Saharan Africa.¹ Due to its endemic nature, it grows well in dry land that needs low rainfall and drained soil. The farmers have categorized *V. amygdalina* to be a multipurpose tree with enormous biomass yield, high compatibility, high adaptability, and easy propagation in relative to other plants. The reason might be because of its capability to enhance soil fertility instead of extorting soil nutrients. In a normal circumstance, *V. amygdalina* does not generate seeds; due to this, it is mostly cultivated through cuttings (Fig. 1D). The germination of this plant is within a shorter cycle; this makes it harvestable for about two rounds within a month and lasts for a maximum of 7 years. Cultivation of this plant is easier due to its compatibility with crops of any kind. Moreover, the bitter taste of *V. amygdalina* serves as its protection against most microbes, insects, and animals except for *Zonocerus variegatus*, weevil *Lixus camerunus* and *Coleoptera curculionidae*⁸.

V. amygdalina is a propitious medicinal plant which is conventionally used for centuries especially amidst the people of sub-Saharan Africa.^{3,8} Additionally, *V. amygdalina* comprises leaf, stem, and root which had been investigated for their pharmacological and phytochemical effects.³ Different parts of these plant are rich in vitamins, fibers, fats, proteins, carbohydrates, amino acids, and minerals.^{1,3,9–11} These species are endowed with fats, proteins, fibers, minerals, amino acids, carbohydrate, and vitamins.^{10,12–15} Previous studies have reported the prospectus of *V. amygdalina* based on pharmacological effects which include antimicrobial, antidiabetic, anti-allergic, antimalarial, antibacterial, anticancer, anti-fungi, antileukemia, analgesic, anti-inflammatory, antipyretic, antihelminthic, hypolipidemic, hepatoprotective, and antioxidant.^{8,13,15–21}