Lippia abyssinica (Otto & A.Dietr.) Cufod.

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Local and common names: ኮሰረት Kosseret, ከሴ Kessie (Amh); ኮሰረት Kosseret (Gur); Kusaayee, Shuukkee (Oro); ኩሳይ Kusay, ከስከሴ Keskese (Tig); Dhigri (Som)

Voucher number and identification: GA057/AHRI/2025

Synonyms: *L. abyssinica* has nine known synonyms, among which *L. adoensis* var. *koseret*, *L. adoensis* var. *pubescens* and *L. grandifolia* var. *longipedunculata are* the later published names.

Varieties recorded in Ethiopia: Previously, *L. adoenis* (now a synonym) was recognized as having two varieties, *L. adoensis* var. *adoensis* and *L. adoensis* var. *koseret*. However, under the revised nomenclature, there are no formally recognized infraspecific taxa or varieties for *L. abyssinica*.

Family: Verbenaceae

Botanical and habitat description

L. abyssinica is an aromatic shrub growing up to 3 m in height. The branches are four angled and covered with fine hairs. The leaves grow opposite each other or arranged in whorles (small circle), with upper surface green and smooth to slightly rough, and the lower surface greyish and densely wooly (tomentose). The flowers are born in small spikes either at the tips of the branches (terminal) or from the leaf joints (axillary). Individual flowers are small measuring about 4-10 mm in width and 5-12 mm in length, elongating to 15-20 mm as they develop into fruit. The corolla is typically purple, pink, or purplish often with a white, yellow or purple center. This species commonly grows in Ethiopia at altitudes ranging from 1600-3000 masl.

Conservation status

L. abyssinica has not been evaluated by IUCN Red List for its conservation status. However, POWO considered the species as not threatened, which is equivalent to “Least Concern” status according to IUCN criteria.

Propagation methods

L. abyssinica can be propagated through seeds, stem cuttings, and division. Seeds collected from mature plants can be sown in a well-draining medium such as mixture of soil, sand and compost, and require regular watering and warm, bright/indirect sunlight conditions. However, seedlings grow slowly and may take several months to reach transplanting size. Stem cuttings (4-6 cm) taken from healthy tips root more quickly when the lower leaves are removed and the cuttings are placed in a moist potting mix under warm, humid conditions, usually forming roots within 2-4 weeks. Division of mature plants is another effective method, where the plant is carefully separated into sections with their own roots and stems, and then replanted individually. This is best done during the growing season and can be repeated every 2 to 3 years.

Cultivation in botanic garden

The species was planted at AHRI-ALERT botanic garden in October 2024 from whole plants transferred from the previous mini medicinal plants botanic garden at the Ethiopian Public Health Institute (Accession number 0121).

Ethnomedicinal uses

The leaves of *L. abyssinica* are used in the Ethiopian traditional medicine to treat various skin diseases including eczema (chife in Amharic) and superficial fungal infections (chirt in Amharic). The dried leaves are powdered together with roasted and pounded barely (Beso) and consumed to relieve stomach complaints. Moreover, boiled flowers and leaves of *L. abyssinica* are taken to prevent flu, indigestion and headaches. The essential oils of this medicinal plant are reported to possess a significant radical scavenging property. Its free radical oxidative stress is implicated in the inhibition of pathogenesis of a variety of inflammatory disease. Beyond medicinal value, the leaves of the cultivated *L. abyssinica* (locally known as Koseret) are widely used to flavour butter used in the preparation of Ethiopian dishes.

Major phytoconstituents

The GC-MS analysis of the essential oil of the leaf indicated linalool, geranial, germacrene D, nerol, geranial, neral, limonene, and carvone.

Pharmacological and safety evidences

Preclinical evidences

Antimicrobial effect: In the disc diffusion assay, high concentration of water-based extract of *L. abyssinica* showed bactericidal effect against *Staphylococcus aureus* and *Enterococcus faecalis*, while *Escherichia coli* remained resistant. However, ethanol and methanol-based extracts were able to kill *E coli*. The plant also exihibted fungicial effect against *Candida albicans* and *Aspergillus flavus*. In addition, the hydroethanolic leaf extract of *L. adoensis* inhibited the growth of *P. falciparum* strains.

Antioxidant effect: Using the DPPH assay, the 80% methanol leaf extract of *L. adoensis* exhibited an IC_{50} value of 10.96 µg/mL, which is comparable to the IC_{50} value of ascorbic acid.

Antipyretic effect: The aqueous and ethanol leave extracts of *L. adoensis* were evaluated for antipyretic activity in Wistar albino mice at oral doses of 50, 100, and 200 mg/kg, showing dose-dependent fever reduction.

Other pharmacological effects: Analgesic, hepatoprotective

Clinical evidence

There are no clinical trials reported.

Safety

In acute toxicity testing, the ethanol leaf extract of *L. adoensis* caused 80% mortality at 10,000 mg/kg, indicating an LD_{50} below this dose. In subacute studies, administration of 2000 mg/kg produced observable toxic effects, including hypoactivity, piloerection, lethargy, and a convulsive episode. Histopathological analysis further revealed hepatic and renal damage characterized by congestion, hemorrhage, severe necrosis, and inflammatory cell infiltration following high-dose extract administration in mice.

Research gaps and recommendations

Further *in vivo* studies on the extracts and isolated compounds of *Lippia adoensis* are needed, along with clinical investigations, to support the development of potential drug candidate molecules.

References

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