Rumex abyssinicus Jacq.
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Local and common names: መቅመቆ Meqmeqo (Amh፣ Gur); Momokkoo, Dhagaa ofolaa (Oro); መቕሞቆ Meqmoqo (Tig); Spinach Rhubarb (Eng)

Voucher number and identification: GA069/AHRI/2025

Synonyms: *H. abyssinica* is known by 12 synonyms, among which *Acetosa abyssinica, R. abyssinicus* var. *calystegiifolius* and *R. abyssinicus* var. *retrorsilobatus* are the later published names.

Varieties recorded in Ethiopia: There are no recognized infraspecific taxa or registered varieties of this species in Ethiopia.

Family: Polygonaceae

Botanical and habitat distribution

R. abyssinicus is perennial herb that can grow up to 3-4 m in height, and has a fleshy rhizome. Its stem is green or reddish-green hairless, hollow, ribbed, cylindrical, furrowed and smooth. The stem can reach up to 3 cm in diameter. Ochreae (dry sheath) are funnel-shaped, brownish, and easily torn. Leaves have petioles often as long as the blades; the blades are thin and hastate (narrow triangular in shape), with basal leaves reaching up to 25 × 20 cm and displaying palmate venation, while stem leaves are much smaller. The inflorescence forms a large, richly branched panicle up to 40 cm long. Flowers occur in clusters on slender pedicels up to 5 mm long. The outer tepals are about 1.5 mm long, brown, membranous, persistent, and reflexed in fruit. The inner tepals are cordate (heart-shaped), 1–1.5 mm long during flowering enlarging up to 6 mm in fruit, and are green with red margins and distinct reticulate veins, turning red-brown when mature. The nut measures 3–4 mm in length, sharply trigonous, and dark brown. In Ethiopia, it is widely distributed across the country at altitudes of 1200-3300 masl.

Conservation status

R. abyssinicus is not currently included in the IUCN Red List. However, POWO reports that the species is not threatened, which broadly corresponds to the IUCN category of Least Concern.

Propagation method

R. abyssinicus is commonly propagated by its seeds. Once the seedlings are large enough to handle, they can be transplanted into individual pots. When they are well established, they can be planted out in the field. The species can also be propagated vegetatively through root cuttings, a method used when for rapid multiplication required or when seed availability and germination is limited.

Cultivation in botanic garden

The plant was established in the AHRI-ALERT botanic garden in October 2024 using a whole plant collected from the former mini medicinal plant garden at the Ethiopian Public Health Institute (Accession number 0091).

Ethnomedicinal uses

In Ethiopia, the roots are predominantly employed for treating gonorrhea, tuberculosis, hepatitis, and gastrointestinal disorders. The leaves and aerial parts are also used to treat conditions such as scabies, malaria, hypertension, diabetes mellitus, skin infections, and eye problems. In veterinary medicine, the plant is used to treat livestock diseases such as scabies and blackleg. Beyond its medicinal value, the young shoots and tubers of the plant have food and cosmetic (used to paint the feet, nails, palms of the hands, and different materials) values, respectively. The roots are also used as a condiment in butter when processing butter by boiling, as they impart colour, flavour and taste to it.

Major phytoconstituents

Emodin, chrysophanol, physicon, helminthosporin, emodic acid, emodin-8-*O*-β-D-glucopyranoside, physicon-8-*O*-β-Dglucopyranoside, and 6-hydroxyemodin are among the major compounds reported from the rhizome, root, and tuber parts of *R. abyssinicus*. It also contains flavanols (epicatechin, epicatechin-3-*O*-gallate, and epicatechin-3-*O*-(4″methyl) gallate), and terpenes (betulone).

Pharmacological and safety evidences

Preclinical evidences

Antimicrobial effect: Various solvent extracts of *R. abyssinicus* roots and rhizomes exhibited pronounced antibacterial activity against *Staphylococcus aureus*, *Streptococcus pneumoniae*, *Escherichia coli*, and *Pseudomonas aeruginosa*. Similarly, isolated compounds, such as emodin, produced zones of inhibition comparable to those of the standard antibiotic gentamicin. With respect to antifungal activity, methanolic leaf extracts demonstrated inhibitory effects against *Candida albicans* and *Trichophyton mentagrophytes*. Antiviral investigations revealed that methanolic root extracts exerted inhibitory activity against Coxsackie virus B3 and Influenza A virus. Additionally, methanol rhizome extracts showed *in vitro* inhibitory effects against *Trypanosoma brucei* cells.

Anti-diabetic effect: The hydromethanolic crude root extract of *R. abyssinicus* demonstrated significant glucose-lowering effects in both normoglycemic and streptozotocin-induced diabetic mice, in a dose- and time-dependent manner. In addition, isolated compounds were shown to inhibit α-glucosidase and α-amylase, key enzymes involved in carbohydrate digestion, while the combination of isolated compounds epicatechin and rutin exhibited pronounced antihyperglycemic activity.

Anti-inflammatory effect: Methanol extracts of *R. abyssinicus* roots and rhizomes demonstrated significant anti-inflammatory activity in both in vitro cyclooxygenase (COX) inhibition and in vivo carrageenan-induced rat paw edema models. Numerous compounds isolated from this plant have also shown promising anti-inflammatory effects. For instance, epicatechin reduces diet-induced human C-reactive protein and inhibits NF-κB *in vivo*.

Wound healing effect: In animal models, wound treated with 5% and 10% (w/w) hydroalcoholic extract ointment of the plant exhibited significant wound healing activity in incision and excision models, as evidenced by increased wound contraction, shorter epithelization time, higher tissue breaking strength and increased hydroxyproline content.

Other pharmacological effects: Cytotoxic effect, anti-Alzheimer's activity, hepatoprotective and neuroprotective properties, and antioxidant potential.

Clinical evidences

There are no reported clinical trials

Safety

The acute oral toxicity evaluation of methanolic rhizome extracts of *R. abyssinicus* in female Swiss mice revealed no mortality at a dose of 2000 mg/kg, suggesting that the LD_{50} exceeds this level. In contrast, sub-acute administration at doses of 1000 and 1500 mg/kg body weight induced notable gross and histopathological alterations in the liver, kidney, lung, and small intestinal tissues.

Research gaps and recommendations

The standardization of the phytochemicals has not been done so far. Pharmacological studies remain largely preclinical, with no clinical trials to validate efficacy or safety in humans. Additionally, toxicological data are mainly limited to acute and sub-acute studies, with minimal information on chronic, reproductive, or genotoxic effects. Additionally, there are no registered pharmaceutical products derived from the plant. Therefore, future research should prioritize standardization of extracts, advanced toxicological and pharmacokinetic evaluations, and well-designed clinical trials to establish therapeutic efficacy and safety.

References

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