Taverniera abyssinica A. Rich.

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Local and common names: ድንጉኛ Dingetegna (Amh).

Voucher number and identification: GA071/AHRI/2025

Synonym: *T. abyssinica* is also known by the synonym *Onobrychis simplicifolia*.

Varieties recorded in Ethiopia: Two infraspecific taxa (varieties) of *T. abyssinica* are recorded in Ethiopia and Eritrea: *T. abyssinica* var. *abyssinica* and *T. abyssinica* var. *tomentella*.

Family: Fabaceae

Botanical and habitat distribution

T. abyssinica is a perennial shrub that can reach up to 2 m height and has woody, deep-growing roots. The young stems are covered with hairs. The leaves are usually simple and very rarely pinnately compound (leaflets arranged in central stalk) with 3 leaflets. The upper surface of the leaflet is hairless while the underside is covered with pressed hairs. The flowers are dark pink to purplish-red. The pods are finely hairy and bear spines up to about 1.5 mm long. The species grows in bushland and limestone areas at elevations ranging from 1700-2150 masl. According to the Flora of Ethiopia (Volume 3), it is considered endemic to Ethiopia but POWO database also lists the species as native to Eritrea, Saudi Arabia, Sudan, and South Sudan, which requires further investigation and confirmation.

Conservation

According to IUCN Red List, *T. abyssinica* is classified globally as a species of Least Concern. However, several sources report that it is considered critically endangered at both local and national levels in Ethiopia, mainly due to over-exploitation of its root and due to habitat loss. The species population in Ethiopia has declined sharply, highlighting the need for urgent conservation measures.

Cultivation in botanic garden

The plant was cultivated in the AHRI-ALERT botanic garden in August 2024 from seedlings obtained in the vicinity of Lemon Town, Oromia region (Accession number 0108).

Ethnomedicinal uses

The roots of *T. abyssinica* are widely used in Ethiopian traditional medicine. They are either chewed or prepared as decoctions to manage cough, sore throat, bronchitis, and other respiratory ailments. Moreover, the roots are used to treat fever, general discomfort, and gastrointestinal problems, including gastritis and abdominal pain, and are valued as a tonic to promote overall health. The root of *T. abyssinica* is among the plant parts most commonly available in local markets for medicinal purposes across the country.

Major phytoconstituents

From the root extracts of *T. abyssinica* formononetin, afrormosin, tectorigenin, medicarpin, and a novel pterocarpan, 3,4-dihydroxy-9-methoxypterocarpan were isolated.

Pharmacological and safety evidences

Preclinical evidences

Antimicrobial effect*: T. abyssinica* exhibits a wide range of pharmacological activities that support its traditional medicinal use in Ethiopia. Studies showed that its aqueous, methanol, and ethanol root extracts possess notable antimicrobial effects against *Staphylococcus aureus, Enterococcus fecalis* and *Escherichia coli* and clinical isolate of *Candida albicans* and *Aspergillus flavus.*

Muscle relaxant effect: An aqueous extract of the roots of *T. abyssinica* antagonized the contractile responses of the guinea-pig ileum to acetylcholine and histamine and the extract relaxed the smooth muscle of the rabbit duodenum, and antagonized the effects of acetylcholine and histamine on this tissue.

Gastroprotective and antispasmodic effects: Additionally, *T. abyssinica* exhibits gastroprotective and antispasmodic activity, and helping to reduce gastrointestinal discomfort. Moreover, the plant demonstrates anthelmintic activity confirming its role in managing intestinal worm infections.

Anti-inflammatory and analgesic effects: The plant also demonstrates significant anti-inflammatory activity, moderate analgesic and antipyretic effects which align with its traditional use in alleviating pain and swelling.

Bronchodilator effect: In traditional practice, the plant is used for respiratory ailments, and scientific findings support antitussive and bronchodilatory effects**,** probably due to saponins and aromatic constituents that soothe airway mucosa.

Other pharmacological effects: Preliminary evidence also suggests antidiabetic potential**,** with extracts showing glucose-lowering effects through improved insulin sensitivity and inhibition of carbohydrate-digesting enzymes.

Clinical evidences

There are no clinical trials reported.

Safety

The toxicological data are minimal. Acute toxicity study revealed that root extract of *T. abyssinica* has a median lethal dose (LD_{50}) of 1409 mg/ml.

Research gaps and recommendations

Although *T. abyssinica* has shown promising pharmacological properties, significant research gaps remain. Comprehensive phytochemical profiling is still incomplete, and systematic toxicological studies are required to establish safety profiles. Mechanistic studies on isolated compounds, particularly smooth muscle relaxants, are needed to clarify their pharmacodynamics. Further optimization of in vitro propagation and agronomic practices is necessary to ensure sustainable use and conservation of this threatened species.

References

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