Brucea antidysenterica J.F. Mill.
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Local and common names: **የደጋ አባሎ** Yedega Abalo, **ዋጊኖስ** Waginose (Amh); Qomonyoo (Oro); Dysentery tree, Bitter orange (Eng)

Voucher number and identification: GA070/AHRI/2025

Synonyms: *B. antidysenterica* is known by eight synonyms, among which *Trichilia siderotricha*, *B. erythraeae* and *B. salutaris are the later published names.*

Varieties recorded in Ethiopia: There are no interspecific taxa and officially registered varieties of *B. antidysentrica* in Ethiopia.

Family: Simaroubaceae

Botanical and habitat distribution

B. antidysenterica is an evergreen, monoecious shrub or small tree, commonly reaching up to 7 m, though sometimes growing as tall as 15 meters. The plant is widely distributed across tropical Africa, thriving at moderate to high elevations, typically between 1400-2800 meters in Ethiopia. The plant is characterized by its alternate, compound leaves, which can be quite large (up to 65 cm long) and are often clustered at the ends of younger branches. The small, regular flowers are unisexual and greenish-pale green, occurring in separate inflorescences on the same plant. The resulting fruits are 1-seeded, drupe-like structures that mature from pale green to yellow-orange or dark red. The species was named in honor of the Scottish explorer, James Bruce, who was in Ethiopia from 1769 -1771.

Conservation status

According to IUCN Red List, *B. antidysenterica* is currently classified globally as a species of Least Concern. However, in Ethiopia, it faces a threat from habitat loss due to deforestation and agricultural expansion.

Propagation method

The plant is propagated from seed, as germination rate is high but seedlings are sensitive to transplanting stress. Seeds remain viable for over a year at room temperature. Alternatively, wildlings (young seedlings from natural regeneration) can be transplanted during the rainy season.

Seed germination can be variable and thus may require pre-treatment such as scarification or soaking.

Cultivation in botanic garden

The species was planted at AHRI-ALERT botanic garden in June 2024 from seedlings donated from Gullele Botanic Garden (Accession number 0019).

Ethnomedicinal uses

B. antidysenterica is traditionally used in Ethiopia for the treatment of various human ailments. The bark, fruits and roots are used to treat dysentery (from which the species name is derived), as well as for anthelmintic properties and management of fever. Moreover, the bark, fruit, seeds, leaves and roots are used to treat diarrhea, indigestion and stomach-ache. The leaves and root are also cooked with meat or infused with milk to relieve asthma; while preparations of the root or leaf combined with fruit and mixed with milk are used against rabies. As part of polyherbal prescriptions, the leaf and fruit are used against leishmaniasis and leprosy; the root and bark against syphilis; the root and leaf against rectal prolapse and rheumatic pain; charred root or leaf powder for wounds; the root against eczema; and the fruit against elephantiasis. Beyond medicine, oil of the fruit is used for soap-making, and the wood serves as firewood or roofing material. A yellow dye from the fruit endocarp colors textiles, adding cultural depth to its utility. Also used as a natural pesticide and for other ethnoveterinary purposes.

Major phytoconstituents

Bruceantin, brusatol, bruceanoside A, bruceacanthinones A and B, have been reported from the roots and bark part *B. antidysenterica*.

Pharmacological and safety evidences

Preclinical evidences

Antimicrobial effect: In complementary *in vitro* assays, the extract exhibited antimicrobial activity against common diarrheal such as *Shigella flexneri*, *Salmonella typhi, and Escherichia coli.* Furthermore, the methanol extract of the leaves of *B. antidysenterica* showed antifungal activity against *Candida albicans.* Different of extracts *B. antidysenterica* inhibited parasitaemia level in *Plasmodium berghei*-infected in mice. The hydroalcoholic seed extract possesses *in vitro* anti-

leishmanial activity against *Leishmania aethiopica* and *L. donovani*. Moreover, Bruceantin was found to be a potent amebicide.

Wound healing effect: The aqueous fraction of 80% methanol leaf extract of *B. antidysenterica* possesses wound healing with a tensile strength boosting effect and accelerating wound contraction, in rodent model.

Cytotoxic effect: *B. antidysenterica* extract and isolated compounds (bruceantinoside A and B) *demonstrated* antileukemic activity *in vivo*. The methanol root and bark extracts, dichloromethane and ethyl acetate fractions, as well as isolated compounds, exhibited cytotoxic effects against different cancer cell lines (A-549, MCF-7, and PC-3).

Other pharmacological effects: Anti-inflammatory, antidiarrheal effect, antimotility and organ protective effects were reported from *B. antidysenterica.*

Clinical evidences

Bruceantin, an isolated compound from *B. antidysenterica*, which is was subjected to Phase I and Phase II clinical trials for cancer (including metastatic breast cancer and malignant melanoma) but no objective responses were observed in clinical trials, and further development was terminated.

Safety

In acute toxicity study the median lethal dose of root extract of the plant was reported to be above 2000mg/kg. In contrast to the seeds, a methanol extract of the leaves did not show any signs of acute toxicity up to a dose of 2000 mg/kg body weight in mice in one study.

Research gaps and recommendations

The standardization of the phytochemicals from this plant have not been done.

References

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