

Artemisia afra Jacq. ex Willd.

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***Artemisia afra* Jacq. ex Willd.**

Local and common names: ቋቋኝ Chikugn, አራጥ Ariti (Amh); Kaapaani, Arrittii (Oro); ቋራኮጎ Ch'irakot (Gur); Natiriya (Wol); Wormwood, Wild wormwood, African wormwood (Eng)

Voucher number and identification: GA074/AHRI/2025

Synonyms: *A. afra* is a stable taxon in terms of nomenclature and there are no widely recognized synonyms for this species.

Varieties recorded in Ethiopia: *A. afra* var. *afra* and *A. afra* var. *friesiorum* Chiov are the recognized infraspecific taxa (varieties) in Ethiopia.

Family: Asteraceae

Botanical and habitat distribution

A. afra is a subshrub or erect perennial herb with a height of 0.5-1 m tall. The basal leaves may reach up to 8 cm in length. The plant has a characteristic greyish appearance; the upper leaf surface is dark green, while the underside is covered with small white hairs. The plant produces small, crowded, nodding flower heads (capitula) that are creamy-yellowish, measuring 3 to 5 mm wide. These are followed by tiny, dry, one-seeded fruits (achenes). The pappus (tuft of hairs on the fruit) is absent. It is an aromatic plant and when it is touched or cut, it emits a sweet scent. It is a perennial plant that grows in the highland areas of Eastern and Southern Africa, typically at altitudes of about 1500-3600 meters above sea level (masl). In Ethiopia, the plant occurs in the mountain regions commonly in Arsi and Bale Mountains.

Conservation status

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

Propagation method

A. afra can be propagated from seeds, cuttings, and root pieces. Tissue culture techniques could also provide an efficient means of propagation where optimal growth is achieved using sterile shoot tip explants.

Cultivation in botanic garden

The plant was established in the botanic garden in October 2024 from a whole plant collected from the AHRI-ALERT Health Village (Accession number 0123).

Ethnomedicinal uses

The root and aerial part of *A. afra* are often used to treat abdominal pain, headache, malaria, constipation, rheumatism, round worm, eye diseases, and common cold and symptoms of respiratory distress. The juice of the crushed leaves is mixed with water or honey and administered orally for stomachache. It is also used as a fumigant, particularly after childbirth or to ward off mosquitoes and snakes.

Major phytoconstituents

A. afra has a variety of phytochemicals including 4 α ,12 α -dihydroxybishopsolicepolide, α -thujone, β -thujone and camphor, which were reported as the major constituents of *A. afra* from South Africa. Whereas, yomogi alcohol and artemisyl acetate were reported to be the major constituents of Ethiopian origin. Other phytochemicals such as α -amyrin, acacetin and scopoletin have also been reported.

Pharmacological and safety evidences

Preclinical evidences

Antimicrobial effect: In microdilution assay, the ethanol extract of the aerial parts of *A. afra* showed antibacterial activity against a panel of gram-positive bacteria. Moreover, the crude leaf extract of the plant showed potent activity against *E. coli*. The dichloromethane extract exhibited anti-plasmodial activity against *P. falciparum*. Antiprotozoal activity was also reported against trypanosome species, *in vitro*. Moreover, *A. afra* was found to inhibit *C. albicans*, and exhibited activity against *Mycobacterium tuberculosis* and *M. smegmatis*.

Cardiovascular effect: The aqueous *A. afra* extracts exerted hypotensive effect, *in vivo*. Furthermore, an isolated compound (scopoletin) induced a dose-dependent decrease in inotropic activity and a decrease in heart rate

Antioxidant effect: Three isolated compounds (scopoletin, acacetin, and botulinic acid) *A. afra* leaves exhibited strong free radical scavenging activity in DPPH antioxidant assay.

Other pharmacological effects: Cytotoxic and spasmolytic effects.

Clinical evidence

In randomized, double blinded superiority clinical trial involving 200 patients, *A. afra* tea infusions were found to be 30% faster in treating schistosomiasis compared to praziquantel.

Safety

The acute and sub-acute *in-vivo* toxicity tests on aqueous leave extracts of *A. afra* indicated the safety of the plant with LD₅₀ > 2500 mg. Moreover, the chronic oral administration of *A. afra* extract did not cause any noticeable toxicity up to the dose of 1000 mg/kg.

Research gaps and recommendations

The formulation and clinical studies on this species are largely absent indicating a strong need for further research in these areas. Furthermore, the standardization of the phytochemicals has not been done. Thus, we recommend standardizing the phytoconstituents of the plant.

References

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