Rhamnus prinoides L'Hér.

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Local and common names: ጌሾ Gesho (Amh, Tig); Geeshoo (Oro); ጊሸ Gishe (Gur); ጌሹ Geshu (Age); African Dogwood, Shiny-leaf, Glossy-leaf (Eng)

Voucher number and identification: GA060/AHRI/2025

Synonyms: *R. prinoides* has eight known synonyms, of which *R. prinoides* var. *acuminata*, *R. prinoides* var. *obtusifolia* and *R. pauciflora* are the later published names.

Varieties recorded in Ethiopia: There are no formally recognized infraspecific taxa or varieties of *R. prinoides*.

Family: Rhamnaceae

Botanical and habitat description

R. prinoides is a shrub or tree that commonly grows to about 6-8 m in height. It has smooth, shiny, dark green leaves that remain on the plant throughout the year. The leaves are arranged alternately along the branches and are simple in shape, usually oval to slightly elongated, and are about 2.5-10 cm long and 1.5-5 cm wide. Young leaves are light green, while mature leaves are dark green and glossy on the upper side and duller underneath. The leaf edges are finely toothed, and the leaf stalks are short. Flowers yellowish green, solitary or in 2-5 flowered axillary fascicles. Each flower has five small sepals, and petals are either very small or completely absent. The fruit is small, round, and berry-like, about 5-8 mm in diameter, and is shiny red when young, and becomes dark red to almost black when fully mature. In Ethiopia, *R. prinoides* is widely cultivated, especially in the highlands, at altitudes ranging from about 1400-3200 masl.

Conservation status

According to IUCN Red List, *R. prinoides* is classified as Least Concern, meaning that the species is currently stable and has a widely spread population and thus is not at significant risk of extinction.

Propagation methods

Propagation of *R. prinoides* is easily achieved through the production of seedlings from seeds. Two alternative propagation methods for *R. prinoides* include direct seeding and mass germination in flower pots.

Cultivation in botanic garden

The species was planted at AHRI-ALERT botanic garden in June 2024 from seedlings obtained from the Gullele Botanic Garden (Accession number 0087).

Ethnomedicinal uses

R. prinoides is a well-known medicinal plant in the country as it is widely used to human and animal illnesses. The leaves are burned in an oven, crushed, combined with butter, and applied topically to the skin to treat tinea capitis, itching, and skin rashes. The leaves are boiled in water and the resulting solution is used as gargle to rinse the throat. Fresh leaves are also rubbed directly onto infected skin to treat infections. The crushed leaves are combined with pure butter and applied as a dressing to the eczema-affected areas. Crushed and powdered leaves are combined with butter and applied as a cream to wounds to treat scabies. Chopped leaves are combined with a little water, filtered, and then taken orally to treat intestinal parasites and animal diarrhea. The powdered seeds are also used to treat ringworm. Beyond medicinal use, the leaves and stems of *R. prinoides* are used in Ethiopia to add flavour in the preparation of traditional alcoholic beverages such as *Tella* and *Tej*. The leaves and stems of the plant also serve as a commercial hopping agent in the brewery industry that can be used as an alternative substitute of hop.

Major phytoconstituents

Emodin, emodinanthrone, physcion, emodinbianthrone, chrysophanol, and musizin are among the identified anthraquinones. Emodin is present in the fruits, leaves, and stems, while emodinanthrone occurs in the leaves, stems, and fruits. Physcion is also distributed across these parts, and emodinbianthrone is mainly found in the fruit. Musizin and β-sorigenin are also isolated from the leaves and roots part of the plant.

Pharmacological and safety evidences

Preclinical evidences

***Antimicrobial effect*:** The methanol and chloroform leaf extracts of *R. prinoides* showed moderate antibacterial activity against important human pathogens such as *S. aureus*, *S. pyogenes*, *S. pneumoniae,* with additional evidence of biofilm inhibition in selected bacterial strains. The plant also exhibited antimalarial activity against both chloroquine-sensitive and chloroquine-resistant *Plasmodium falciparum* strains. Furthermore, leaf and root bark extracts showed chemo-suppressive effects against chloroquine-resistant, blood-stage *Plasmodium* infection in animal models.

***Wound healing effect*:** *In vivo* animal studies revealed that the hydroalcoholic extracts of the leaves of *R. prinoides* exhibit significant wound-healing activity, as evidenced by accelerated wound contraction and a reduced epithelialization period.

***Other pharmacological effects*:** Antioxidant, anti-inflammatory, insecticide, cardioprotective, anti-atherosclerotic, cytotoxic and antimutagenic effects were reported from different parts of *R. prinoides.*

Clinical evidences

No clinical trials reported.

Safety

In vivo acute toxicity study showed that the LD_{50} of *R. prinoides* is greater than 5000 mg/kg body weight. Moreover, repeated doses of the plant extract didn't show overt sign of toxicity.

Research gaps and recommendations

The standardization of the phytochemicals needs to be done**.** Further *in vivo* studies on the extracts and isolated compounds of *R. prinoides* are needed, along with clinical investigations, to support the development of potential drug candidate molecules.

References

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