

***Rydingia integrifolia* (Benth.) Scheen & V.A.Albert**
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Local and common names: ጥገጃጅጅ Tunjit (Amh); Xuunjitii (Oro); Tunjite, Chendog, Shankud (Tig); Abyssinian Rose (Eng)

Voucher number and identification: GA059/AHRI/2025

Synonyms: *R. integrifolia* is known by two synonyms, namely *Otostegia integrifolia* and *Moluccella integrifolia*.

Varieties recorded in Ethiopia: There are no infraspecific taxa and officially registered varieties of *H. abyssinica* in Ethiopia.

Family: Lamiaceae

Botanical and habitat distribution

R. integrifolia is an indigenous plant of Ethiopia. It is a shrub which grows up to 3 m tall. The shrub is characterized by its angled stems, which often bear paired spines at the nodes, and its nearly sessile or shortly petiolate leaves that are aromatic. The flowers are two-lipped, featuring an upper petal lip that is typically white or cream-colored, and a lower petal lip with a distinct yellow or yellow-orange color. The plant grows in the wild but is also cultivated in gardens. It grows in montane bush lands and woodlands, particularly on grazed slopes, at elevations of 1300-2800 masl.

Conservation status

R. integrifolia 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. In Ethiopia, the plant is reported to be overexploited for various purposes with no documented conservation measures. Therefore, it requires attention to ensure its sustainable use and protection.

Propagation method

Limited and unauthenticated literature indicates that *R. integrifolia* is primarily propagated by seed. Vegetative propagation through cuttings has also been reported. However, further verified research is required to guide effective multiplication of the species.

Cultivation in botanic garden

The plant was planted in AHRI-ALERT botanic garden in June 2024 from seedlings donated from Gullele Botanic Garden (Accession number 0079).

Ethnomedicinal uses

The leaves, roots, stems, and essential oil are utilized for human and livestock ailments, as well as for cultural practices in Ethiopia. The leaf part is used for the treatment of malaria, tonsillitis, uvulitis, hypertension, stomachache and common cold. The dried leaves and wood are burned on a traditional charcoal stove, especially in the early evening, to create smoke that kills or repels insects. The aerial parts are used for fumigating houses against disease and for fumigating vessels used in beer brewing.

Major phytoconstituents

GC-MS analysis of *R. integrifolia* indicated the presence of (+)-1-methyl-4-(5, 9-dimethyl-1-methylene-deca-4, 8-dienyl)-cyclohexene as the major component. Further chromatographic and spectroscopic analysis revealed the presence of terpenoids (+)-axinyssene, otostegindiol, preotostegindiol and pentatriacontane from the air-dried leaves of *R. integrifolia*.

Pharmacological and safety evidences

Preclinical evidences

Antimicrobial effect: The leaf extract of *R. integrifolia* has shown antibacterial activity against Gram positive and Gram-negative bacteria while the essential oil has shown activity against different fungal species.

Antimalarial effect: 80% methanol extract and isolated compound, otostegindiol, have produced significant antimalarial activity in 4-days chemo suppressive test in mice.

Antioxidant effect: The leaf extract of *R. integrifolia* has shown free radical scavenging activity against DPPH and Ferric reducing antioxidant power (FRAP) assay.

Other pharmacological effects: The leaves extract has shown analgesic, anti-inflammatory, antidiabetic, hypoglycemic and anticancer effect.

Clinical studies

There are no clinical trials reported to date.

Safety

In acute oral toxicity study, the administration of 80% of methanol extract to mice at a dose of 5000 mg/kg did not show any signs of toxicity. However, in a sub-acute toxicity study, a slight increment in weight and reduction in packed cell volume (PCV) was observed.

Research gaps and recommendations

The formulation and clinical studies on this species are largely absent. Therefore, research on this area is highly recommended.

References

1. Giday M, Teklehaymanot T, Animut A and Mekonnen Y (2007). Medicinal plants of the Shinasha, Agew-awi and Amhara peoples in northwest Ethiopia. *Journal of Ethnopharmacology* 110: 516-525.
2. Tesso H and Konig WA (2004). Terpenes from *Otostegia integrifolia*. *Phytochemistry* 65: 2057-2062.
3. Tadesse S, Messele B, Seyoum A, Mazumder A, Bucar F and Asres K (2011). Essential Oil of *Otostegia integrifolia* Benth: Composition, Antimicrobial and Antioxidant Activities. *Ethiopian Pharmaceutical Journal* 29: 79-86.
4. Endale A, Bisrat D, Animut A, Bucar F and Asres K (2013). *In vivo* antimalarial activity of a labdane diterpenoid from the leaves of *Otostegia integrifolia* Benth. *Phytotherapy Research* 27:1805-1809.
5. Shewamene Z, Abdel Wahab M and Birhanu Z (2015). Methanolic leaf extract of *Otostegia integrifolia* Benth reduces blood glucose levels in diabetic, glucose loaded and normal rodents. *BMC Complementary and Alternative Medicine* 15: 19.