

**Bioprospecting Potential of *Thymus schimperi*
for Access and Benefit Sharing**



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1. Introduction

Ethiopia is endowed with rich plant biodiversity and associated traditional knowledge which creates an environment for successful bioprospecting. However, like other developing countries, Ethiopia lacks financial resources to exploit the plant genetic resources significantly. The only option for Ethiopia is to collaborate with the developed nations or domestic investors and interested one in pharmaceutical, cosmetics and other companies alike and jointly explore them strategically and wisely.

The Ethiopian Biodiversity Institute (EBI), the National Competent Authority via Genetic Resources Access and Benefit Sharing Directorate, plays a practical role in the implementation of the Nagoya Protocol on Access and Benefit Sharing of Genetic Resources and Associated Traditional Knowledge. Accordingly, one of the activities of the Access and Benefit Sharing Directorate is to play a proactive role of introducing easily accessible potential genetic resources for a possible bioprospecting and ABS agreement.

Therefore, the objective of this information is to encourage any bioprospecting company or an individual interested to work on the genetic resource, the commercially important thyme oil, *Thymus schimperi*, for medicinal uses of highly antimicrobial, antiseptic and antifungal activities.

2. Description of the Plant

Thymus schimperi is one of the 350 species of the genus *Thymus* (Labiatae), which belongs to the family Lamiaceae. The genus name thyme, which is derived from Greek, refers to courage and sacrifice. Thyme was used as incense in ancient temples. *Thymus schimperi* is a multipurpose plant that has been used for various remedies as constituents of traditional medicine in Ethiopia (Kassahun Dires *et al.*, 2018).

Thymus schimperi and *Thymus serrulatus*, both are locally known as ‘Tosign’ (in Amharic) and endemic to Ethiopia. It is perennial herb, woody at the base and 5-40 cm high. It is used medicinally and as culinary herbs. The leaves of *Thymus* are used in Ethiopia as spices to flavor a wide range of food products as well as medicines (Nigist Asfaw *et al.*, 2000; Ermias Dagne *et al.*, 1998).

3. Distribution

Thymus schimperi Ronniger is endemic to the Ethiopian highlands growing on edges of roads, in open grassland, mountains, on bare rocks and on slopes, between altitudes of 2,200-4,000 m. It grows in the wild at higher altitude areas such as Bale and Debre Sina. *Thymus schimperi* is comparatively found widespread in central, eastern and northern Ethiopia which is restricted to Afromontane and Afroalpine regions of Bale, Shewa, Gonder, and Wollo (the major growing areas in Ethiopia) (Nigist Asfaw *et al.*, 2000; Destaw Damtie and Yalemtehay Mekonnen, 2015).

4. Ethno-medicinal and other uses

Thymus schimperi is used as traditional medicine and herbs used in cooking. The fresh or dried leaves of both species (*T. schimperi* and *T. serrulatus*) are used locally as condiments in the preparation of chili powder, stew, bread and tea. Wild thyme, which is used to make a tea, is harvested by people living close to the town of Dinshu and near Menz. Its dried leaves are put in plastic bags and sold to travelers on buses.

The herb is mixed with water to make tea and is recommended as a medicinal remedy for respiratory problems, gastrointestinal disorders and liver disease (Dawit Abebe and Ahadu Ayehu, 1993). The dried leaves of *T. schimperi* are also used in traditional medicine for the treatment of headache, gonorrhea, inflammation, spasm, hypertension, thrombosis, urinary retention, mental illness, eye disease, toothache, stomachache, earache, spasmodic cough, laryngitis, bronchitis, renal diseases, infections, liver disease, leprosy, lung TB, *Tinea capitis*, acne, ascariasis. Its dried leaves are also used to wash skin as mouth wash in Ethiopia (Dawit Abebe and Ahadu Ayehu, 1993; Nigist Asfaw *et al.*, 2000; Parvev and Yadav, 2010).

Thymus schimperi is also used as an aromatic plant and for making spice almost everywhere in Ethiopia.

5. Chemical composition and Pharmacological activities

Medicinal plants are considered as rich resources of ingredients which can be used in drug development. *T. schimperi* is richer in medicinally important constituents such as thymol and carvacrol. It is found that the essential oil obtained from *T. schimperi* grown in Ethiopia, is rich

in carvacrol (66.2%) and thymol (50%), constituents of thyme which are responsible for antibacterial activity against gram positive and gram negative bacteria due to their effect on the bacterial membrane (Ermias Dagne *et al.*, 1998; Atilaw Wube *et al.*, 2018).

Many *Thymus* species yield a commercially important thyme oil, which exhibits highly antimicrobial effect. The volatile oil from thyme was found to contain p-cymene, γ -terpine, carvacrol, rosmarinic acid, eugenol and thymol. The volatile oil has carminative, antiseptic, antimicrobial and antifungal activities (Chandravanshi, 2017). Kesatebrhan Haile (2013) indicated that the phytochemical screening results showed that antimicrobial activities of *Thymus schimperi* could be attributed to the presence of cardiac glycoside, anthraquinones, phenolic compounds and steroids.

6. References

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