Bioprospecting Potential of *Waltheria indica* L. for Access and Benefit Sharing

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1. Introduction

Ethiopia is lucky to be gifted with rich biodiversity and traditional knowledge that could pioneer successful bioprospecting. However, like any other developing countries, Ethiopia lacks technical expertise and monetary resources to explore them 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 National Competent Authority, the Ethiopian Biodiversity Institute (EBI), through the Access Benefit Sharing Directorate, plays a practical role in the implementation of the Nagoya Protocol on Access and Benefit Sharing of Genetic Resources and Associated Community Knowledge. Based on Proclamation No 482/2006 and Regulation 169/2009 (Access to Genetic Resources and Community Knowledge and Community Rights), Ethiopia has been implementing the access and benefit sharing objective of the CBD. Both the Proclamation and Regulation include a range of issues such as ownership, user rights, conditions for access, benefit sharing, types of benefits, powers and responsibilities among others.

Therefore, the objective of this information is to encourage any bioprospecting company or an individual interested to work on the genetic resource, *Waltheria indica* L. for medicinal and industrial activities.

2. Plant Description

Waltheria indica is a short-lived, perennial plant with several erect or ascending more or less woody stems that can be branched from the base. Its local name is ‘Albe’ (in Berta). The plant grows from 0.5-2 meters tall (Edwards *et al.,* 1995). *Waltheria indica* begins flowering at about 6 months old, and blooms more or less continuously for the rest of their lives. Reproduction is by seeds, which are dispersed by water, agricultural equipment and grazing animals.

3. Ecology and distribution

This plant is commonly grown associated with *Acacia – Combretum, Acacia – Commiphora, Acacia - Balanites, Boswellia* and *Combretum – Terminalia* woodland and bushland. It often grows on rocky hills or on gravelly soil, river-beds at altitudes of 600-1650 m. It is distributed through Shewa, above and to the west of the 1000 m contour; through Tigray Region, above and

to the west of the 1000m contour; Keffa, Gamo Gofa, Sidama, Hararghe and Bale (Edwards *et al.*, 1995). Personal observation during documentation of traditional knowledge of Benishangul Gumuz Region reports *Waltheria indica* as one of traditional medicinal plant.

4. Chemical composition of *Waltheria indica*

The qualitative phytochemical analysis of root, stem and leaf extracts of *Waltheria indica* reported the presence of saponins, alkaloids, anthraquinones, flavonoids, tannins/ phenols and cardiac glycosides at varied amounts. High amount of saponins and anthraquinones were reported to be present in the three different parts of the plant than other phytochemicals. Tannins and cardiac glycosides were more observed in the roots and leaf extracts than in the stem extracts (Olajuyigbe *et al.*, 2011). The phytochemical assessment indicated the presence of alkaloids, flavonoids, sterols, terpenes, cardiac glycosides, saponins, anthraquinones and carbohydrates (Ibrahim Ahmed and Syed Baquer Mahmood, 2014).

5. Significance

Waltheria indica is a potential genetic resource for bioprospecting due to its active phytochemicals in the roots and leaves.

4.1. Medicinal use

Waltheria indica is harvested from the wild for local medicinal use. It is commonly used in traditional medicine of Africa, South America and Hawaii, mainly against pain, inflammation, diarrhea, dysentery, conjunctivitis, wounds, abscess, epilepsy, convulsions, anemia, erectile dysfunctions, bladder ailments and asthma (Zong *et al.*, 2013). Various extracts are used in Africa as tonics, analgesics, purgatives, and to reduce fevers. In Hawaii, the root is chewed to ease sore throats and treat gonorrhoea and leprosy in humans. Stems are used as a chewing stick. The plant extracts are used as an eye bath in Panama and used for treatment of cough and curing female sterility. Personal observation during documentation of traditional knowledge of Benishangul Gumuz Region reports *Waltheria indica* as one of traditional medicinal plant.

The plant is applied externally on skin to heal eruptions and wounds. A decoction of various plant parts is taken as a treatment for fever (febrifuge) and syphilis (antisiphylitic). A decoction

of the leafy stems is taken to relieve fevers, coughs, colds, bladder ailments, vaginal infections, hypertension, ulcers and as a remedy for haemoptysis (http:// tropical.theferns.info/).

According to Olajuyigbe *et al.* (2011), *Waltheria indica* is useful in the treatment of enteric diseases, antibacterial effects and source of new antibiotic compounds. The plant is used as an aspirin-like anti-inflammatory drug (Saunders, 2007). It is used to treat diarrhea by traditional healers in Nigeria (Zailani *et al*., 2010). It is traditionally used to treat malaria (Jansen *et al.*, 2010), hemorrhoids and cancers (Graham *et al.*, 2000), leprosy (Olajuyigbe *et al*., 2011), analgesic activity (Mohammed *et al*., 2007), infertility (Ribuot *et al*., 2013), bladder ailments, erectile dysfunction and impotence (Bekro *et al*., 2007).

4.2. Industrial activities

Waltheria indica is also a source of a fiber. The plant produces a fiber that was formerly used for making cords, sacking, padding and sandals. An extract of the plant, is used in a commercial cosmetic for its ability to inhibit melanin synthesis and whiten the skin.

Therefore, *Waltheria indica* is promoted as the potential genetic resources for bioprospecting due to its active phytochemicals in the roots and leaves, its locally well-known traditional medicinal properties and its industrial activities.

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