

# Anthropogenic and Natural Threats of *Acacia Tortilis* in Central Zone of Tigray, North Ethiopia

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## Abstract

The study was conducted in central zone of Tigray at Tanqua Abergelle Wereda in a specific site called Sheka Tekli. It is common to observe a number of acacia tortilis being uprooted and debarked by the residents of the area and hence, an investigation was held to identify the causes of the problem. From the field observations, the reason for uprooting of big acacia tortilis was found due to unbalancing of the extended canopy of the tree. When the canopy load is heavy to one side, it exposes to uprooting from wind effects and this was what has been observed from the field. Moreover, it was able to investigate that residents of the area intentionally debark the tree and the reason was to use it for fuel wood after drying. Even beyond this, there are some people who debarks the tree for different purposes without knowing its consequence on existence of the tree. Hence, environmentalists, policy makers and other concerned bodies should give due emphasis for saving and maintaining of these keystone species.

**Keywords:** Acacia tortilis, Canopy, Debarking, Uprooting, Keystone species

## Introduction

Researchers showed that Acacia trees are known as a versatile source of components with bioactive properties (Reigosa et al., 1984; Rafiqul Hoque et al., 2003), suggesting a large inhibitory potential in Acacia genus which dominates the dry south Saharan regions of Africa (Barnes et al., 1996). Acacia tortilis is a small to medium-sized evergreen tree or shrub that grows up to 21 m tall; well-developed multiple boles support a flat-topped or rounded, spreading crown. The generic name 'acacia' comes from the Greek word 'akis', meaning a point or a barb. The name 'tortilis' means twisted and refers to the pod structure. A. tortilis is drought resistant (

(Abdallah et al., 2008; Grouzis & Le Floch, 2003) can tolerate strong salinity and seasonal water logging and generally forms open, dry forests in pure stands or mixed with other species. The long taproot and numerous lateral roots enable it to utilize the limited soil moisture available in the arid areas.

The tree favors alkaline soils and grows in sand dunes, sandy loam, rocky soils and other soils that drain well. Acacia tortilis, is native of Sudan, Ethiopia, Yemen, Somalia, part of Kenya, Tanzania, Arabia and Southern Israel. Bark on trunk usually rough and fissured, grey to black brown. Crown usually flat and spreading (parasol type) but sometimes (especially in sub sp. raddiana) rounded. Acacia tortilis, a member of family Mimosoideae is very distinctive and easily recognized with the characteristics mixture of long straight spines and shorter hooked ones combined with spirally twisted or contorted crown has given it the popular name of Umbrella thorn. The natural regeneration of Acacia tortilis is poor due to many different reasons such as hard seed coat which leads to failure of seed germination under arid land conditions, owing to lack of sufficient moisture at the top soil. On top of this, plantations in arid region are largely accessible to either trampling or grazing by animals.

## Materials and Methods

### Area description

The study (observation) was conducted in central zone of Tigray at *Tanqua Abergelle Wereda* in a specific site called *Sheka Tekli Tabia*. *Tanqua Abergelle* is located at about 120 kilometers away from the capital city of Tigray regional state, Mekelle, to the west direction. The rainfall pattern of the district is monomodal with a wet season of about two months occurring in July to August. It is located at 13° 14' 06'' N latitude and 38° 58' 50'' E longitudes and agro ecologically characterized as hot warm sub- moist low land (SM1- 4b) below 1500 m.a.s.l. The mean annual rain fall and temperature are 350 – 700 mm and 24- 41 °C respectively. As the area belongs to semi arid, its vegetation type is mostly dominated by acacia species. Particularly, the species acacia tortilis are naturally found in these areas.

### Research methods

This research was done based on simple field observations and interviewing some residents of the area. Accordingly, detail observations were conducted for identifying on what could be the reason for uprooting the species. On top of this, it was observed that there are some acacia tortilis which are peeled their bark and consequently dried, then reason why this happens was investigated through interviewing some residents of the area and beyond this; it is common to observe peoples transporting fuel wood to the nearby cities. This was also

used as a clue how the tree species are very important for fuel wood in the area and could deliberately let dry the trees so as to use it later.

### Result and discussion

From the field observations and response of some residents, it is common to see uprooted acacia tortilis. The roots of the acacia tortilis were extending horizontally and which this makes susceptible to wind (figure1). The reason why the roots of these species extend horizontally is believed to be due to the existence of water and fertile top soil relative to the sub soil. Beyond this, there are also some trees that extend their roots proportional to their canopy cover, which this anchors and maintains the balance of the tree. Though this could be the fact, other activities such as lopping on some side of the tree for the sake of many different reasons, which could be for fencing and fuel wood may imbalance the canopy and lead to easily uprooting of the species by wind.



Figure1. Observed uprooted acacia tortilis at *Tabia Sheka Tekli* (own photograph)

However, beyond the above reasons, death of some roots which could be the tap root or other lateral roots could also be a reason for uprooting of the species. Hence, introducing different silvicultural management activities such as reducing or managing the canopy size of the species to keep or maintain their balance could be used as an option to overcome the problem.

Apart from the natural threats, an anthropogenic threat of acacia tortilis was also observed to be a great concern in the area. So many people, some knowingly and others unknowingly peel the bark of acacia tortilis. According to the respondents, some people intentionally peel the bark of the tree so that when drying they need to use it for their own fuel wood or selling purpose. Others also, peel the bark without knowing the negative consequence on the tree species, while, their main objective is to use the peel for tying of different equipments. For example, they use it, while constructing traditional houses and many other different purposes.



Figure2. Anthropogenic threats of acacia tortilis (own photograph)

It is known that if a tree is debarked the translocation of food and water to and from roots and leaves will cease and this leads to the total death of the tree and this is really what is happening in the area (figure2). Therefore, as the species are environmentally very important, it is timely indispensable issue to create awareness on the residents of the area. Moreover, policy makers and environmentalist should give due emphasis on how to save and maintain these threatened species.

## Conclusion

In general, *acacia tortilis*, a member of family *Mimosoideae* is very distinctive and easily recognized with the characteristics mixture of long straight spines and shorter hooked ones combined with spirally twisted or contorted crown has given it the popular name of Umbrella thorn; however the foliage is smaller than many acacias, and the whitish flowers in small round heads are also features that shared with other *Acacia* species. *Acacia tortilis* is drought resistant, can tolerate strong salinity and seasonal water logging and generally forms open, dry forests in pure stands or mixed with other species. However, due to the extended nature of the canopy, if one side of the branch is lopped unintentionally, the tree loses its balance and finally uprooted by wind. Moreover, different people debark the tree so that they need to use it for fuel wood after drying. Hence, environmentalists, policy makers and other concerned bodies should give due emphasis for saving and maintaining of these keystone species.

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