

# The Types of Aloe species and their Multi-Function in Southern Ethiopia the Cases of Hammer District



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## Abstract

Aloes are a multi-functional perennial with or without woody trunks. It is extensively distributed in sub-Saharan Africa, Madagascar and other South Africa nearby islands. Forty six aloes species were recognized in Ethiopia out of which 24 species are endemic. Six Aloe species were found in Hamer district of the southern Ethiopia. Their multi-functionality was assessed through conducting focus group discussions with different members of the pastoral and agro-pastoral communities at three discrete kebeles of the district. The pastoral and agro-pastoral communities were inhabited in this arid and semi-arid areas were often considered as communities with fewer livelihood options. Thus, sustainable utilizations of multi-purpose perennials such as: aloes is playing very crucial role for widening the livelihood options. Fewer studies regarding on distribution, ecology and benefits have been conducted so far in Ethiopia and it is highly recognizable. However, as the potential of the resource and expected outputs for nearby communities still further research and adoption of proven technologies are needed to conduct so as to devise successful utilization strategies.

**Keywords:** *Acacia-commiphora*; *Combretum-terminalia*; Arid and Semi-Arid areas; Pastoral and Agro-pastoral communities

## Introduction

Aloes are belonging to the family (Aloeaceae) and they are perennials with or without woody trunk and Aloes is the genus from the seven genera included in the family. Aloe species occupied wider ranges of habitat and assumed to have various growth forms Smith & Van Wyk [1] Van Wyk & Smith [2]. The genus, which includes about 400 species, it has mainly distributed in southern Africa, including Madagascar and the Mascarenes. Forty six species of Aloes were recognized in Ethiopia and Eritrea out of which 24 Aloe species are endemic to Ethiopia. This unique group of succulent plants provokes wide-ranging interest among both scientists and plant collectors Smith & Van Wyk, Smith et al. [2,3]. It was believed that an immense indigenous knowledge has been expected to found in local communities whom inhabited nearby Aloes potentially grown areas. Using Aloes leaves exudates for medicinal purpose was dated back thousands of years in the history Grace et al. [4] Trade in wild and cultivated Aloes for health products is central to the livelihoods of many people in Arid and Semi-Arid lands where the cultivation of conventional crops is unfeasible.

In spite of the potential benefits which tapped from this plant species very few studies has been conducted so far in Ethiopia

and indeed there was a considerable baseline information's regarding their distributions, ecology and importance's but still further studies need to look forward so as to devising sustainable utilization strategies to be placed at local and regional levels. This short communication is intended to examine the hypothesis; what type of Aloe species are found in the study area? What types of benefits are extracted from the existing Aloe resources? With this regard the objectives of this short communication is to confirm the existence of six Aloe species found in Hamer District of Southern Ethiopia and to switch further studies for documenting the local community experiences on utilization of existing Aloes species.

## Bio-physical and Socio-economic survey

During the excursion six aloe species were recognized (Aloe rivae baker, Aloe otallensis baker, Aloe calidophila Reynolds, Aloe yavellana Reynolds, Aloe rugosifolia Gilbert and Sebsebe and Aloe pirottiae Berger). According to the local community naming these six aloes were divide into two groups and locally names "Wollqentti" and "Gellab Wollqentti" for the first four and the latter two species respectively. Moreover, these grouped Aloes species could have different distributions and accordingly,

the first four species were highly frequent in upper Humid Qollaperiphery of the district while the latter two species were highly frequent in lower Dry Qolla periphery of the district.

Regarding the associated vegetation categories the upper periphery more dominated with Combretum-Terminalia woodland and wooded grassland type of vegetation while the lower periphery is tended to Acacia-Commiphora wood land and bush land vegetation type. Different naming by the local community might be related with observations of existing distribution differences among the Aloes species and of course they used a name of neighbours as suffice especially for plants inhabited adjoining to the neighbours. This experiences of naming were depicted in the second group of Aloes the word "Gellab" were belong to the name of Dassenach ethnic group whom shared a boundary in the lower south - western periphery of the district. Further reading about their ecology, distribution and uses was described elsewhere. Three focus group discussions (FGD's) were held in three Kebeles (lower administration unit of the country) of the Hamer district. Each group has a member of 9 - 11 individuals of the community with different social classes, gender and ages. However, it was believed that elders are the foremost to know folk medicine and hence, the team tried to encompass more elders as possible while organizing the focus group teams. Indeed they were discussed regarding the possible utilities of Aloes as remedy for various diseases and disorders which recurred in Human and livestock's lives.

### Multi-purposes of Aloes

According to the FGD's;

i. Aloes were a good source of feed (browse directly and chopped) and moisture for goats especially during dry season. This is in line with aloes as a source of browse for livestock's and elephants somewhere in Africa Parker and Bernard [5].

They used Aloe sap:

ii. The aloe latex was potentially used for remedy of snack bite. They used to mix Aloe latex with certain proportions (1:40 ratio) of water and enforced to drink the one who have bitten as short as possible after the attack.

iii. For worms and internal parasites both for human and livestock's

iv. They rubbed Aloe sap on injured and scarred skin so as to fasten the healing process

v. to abort a child during early phases of pregnancy

vi. to overcome malaria disease and its symptoms

vii. It is used to cease a child from breast feeding

viii. Through mixing with different constituents they used as detergent to wash cloths and others goods.

The medicinal role of Aloespecie is believed to be due to the synergistic action of different compounds and constituents Anbessa and Kere, and this in turns it maximize the multi-functionality of the Aloes for wider spectrum of disease and disorders.

Moreover, the Aloes flowers are appreciable sources of bee forage and this is in line with the reports of Human and Nicolson [6] they argue that Aloes are a good source of moisture and carbohydrates for honeybees especially when other feed sources are inadequate. This is mainly due to the fact that producing considerable amount of nectar for honey production And this in turn it secures high production of honey especially for pastoralist communities whom honey production is the third main source of income followed to livestock rearing and opportunistic crop productions.

Majority of aloes thrive in almost any soil type, requiring neither any fertilizer nor any special soil preparation before planting Smith & Van Wyk [2,7] they are found flourishing on nutrient deficient, rocky or gravelly soils Wabayele & Kyalo [8] and well adapted for moisture stress and highly disturbed areas. This might be the fact that adventitious root systems that grow only a few centimetres below the soil surface allow aloes to benefit from relatively low amounts of precipitation Jack, Smith & Van Wyk [2,8,9]. The aloe fleshy leaves, stems, or occasionally fleshy fusiform roots can store a large amount of water this makes to survive even with exceeding high temperature and consequent high evapo-tranpiration through refilling the water losses within a day after relief from heat and drought stress Newton [10]. On the other hand there were findings which showed that juveniles are depending on certain amount of moisture inputs for survival in arid ecosystems Noy-Meir [11]. This seems to be the response of aloes for extreme environments is depend on type of species and phase of growth.

The aforementioned capabilities of the Aloe species enable them to be a key plant species for lowland ecosystems Anbessa and Kere. On the basis of these facts aloes would be a considerable option for rehabilitation of degraded lands: barriers for soil erosion through stabilizing soils Smith & Van Wyk [2] and in favor of associated plant communities facilitate litter cover, soil seed banks and soil water retention King [12] as a result aloes could modify soil micro-climates (both moisture and temperature). Moreover, Aloes can serve as a nurse plant for new emerging plants King and Stanton [13] this is mainly due to the fact that colonising and ameliorating harsh conditions in sparsely vegetated or completely denuded landscapes King, Smith and Correia [2,12] and this in terns pronounced as aloe plants have a significant contribution or use for restoration of degraded ecosystems.

### Summary

There were little attentions to invest on Aloe plant species establishment, production, handling and processing in the

country in general and in the region in particular. Different products and services were potentially collected from different parts of the Aloe plants. However since the last three years there was an attempt in collaboration between AFD (Action for development - domestic NGO) and the local communities. Selected members of the pastoral and agro-pastoral communities were organized, trained and eventually engaged in processing soaps from latex of aloes and other constituents. Such efforts need to be supported with organized research findings, proven technologies and in turn development strategies.

The pastoralist communities were lived in Arid and semi-Arid areas which often considers as a land with a few livelihood options Worku et al. [14]. Uneven and unpredictable nature of the rainfall distribution has always been a severe constraint for both crop and pasture productions Lemenih & Kassa [15]. And thus, this would be the right time to look for devising strategies on sustainable utilization of existing woody and non-woody based natural resource potentials such as: aloes. With this regard perennial multi-purpose plant species such as: Aloes could play a substantial role in widening diverse sources of livelihood income for the pastoralist communities while restoring and modifying the ecosystem in certain way so as to support crop and pasture productions.

In spite of their multi-purpose potentials they were threatened due to agricultural expansions even it took place in marginal lands, habitat destruction for purposes of settlement and climate change related impacts such as; drought Dessalegn, Fode, Duncan et al. [16-19] . Hence, further studies are needed to be conducted on: population structure, growth pattern and multi-purpose uses across different communities with different social setups [20].

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