

ASSESSMENT ON ALOE SPECIES AND THEIR POTENTIAL TO CONTRIBUTE TO RURAL LIVELIHOODS IN SOMALILAND

Candlelight for Environment, Education & Health

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Executive Summary

This report explores the possibility of aloes to generate income for the rural poor in Somaliland. In Somaliland and Somalia, The *Aloe* taxa (species and subspecies) recorded is 30, of which 24 are endemic and 13 recorded as threatened. The current main threats are habitat destruction and fragmentation resulting from increasing human activities. These species vary in terms of distribution and diversity, in line with the different vegetation zones. The report also looks into the traditional and contemporary use of aloes as a medicine, cosmetic, animal feed, and other socio-economic benefits. The report also brings experience elsewhere in terms of plantation and processing.

The report contains a set of recommendations including the need to develop a strategy for the sustainable management of aloe species to circumvent the danger of over-harvesting, the need to have a plan for *in situ* and *ex situ* conservation. It recommends the initiation of a small pilot project on aloe cultivation in order to set groundwork for a future wider intervention in this arena. The project components may include identification of the most commercially viable species, multiplication of aloes from suckers, land preparation, spacing, intercropping with other cereal plants, planting and harvesting.

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1. Introduction

The genus aloes embraces over three hundred sixty different succulent-leaved species and subspecies which grow in Africa, the Arabian Peninsula, and certain Islands of the Indian Ocean in East African.¹ It is also widespread in Europe and the Americas. It is a short-stemmed or stemless or very short-stemmed rosettes of flowering succulent belonging to the Lily (*Liliaceae*) family. Aloes are featured in prehistoric rock art by Bushmen, and have been cultivated for centuries for its medicinal and cosmetic value. The earliest recording is 1500 B.C. in the Papyrus Ebers – ancient Egyptian medical record of herbal knowledge. Historians state that Aristotle persuaded Alexander the great to conquer the Island of Socotra, off the north eastern coast of Somalia, because of its abundance of aloes, for the purpose of obtaining sufficient amount of aloe as a wound healing agent for his combatants.²

In Somaliland and Somalia, The *Aloe* taxa (species and subspecies) recorded is 30, of which 24 are endemic and 13 recorded as threatened.³ These species vary in terms of distribution and diversity, in line with the different vegetation zones. The current assessment revealed that *Aloe meglacantha*, locally known as *Dacar Dhegweyn*, as the most widespread species within the areas covered.

While taxonomists identified and classified the different aloes species, each with specific botanical name, local communities generally use “*Dacar*” across the board, a term meaning to “Aloes” in Somali. However, there are few exceptions which carry the specific vernacular names viz. *Aloe meglacantha* (*‘Dacar Dhegweyn’*), *Aloe retrospiciens* (*‘Dacar Budhuq’*) and *Aloe rigens* (*‘Dacar mardoodi’*). *Aloe somaliensis*, *Aloe hildebrandtii*, *Aloe hemmingii*, and *Aloe jacunda* as (*Dacar Biyood*), literally ‘the watery Aloe’. In 2014, Ahmed Awale spotted a local species known as “*Dacar Cas*” (Red Aloe) near Alaal-Adka village, 45 km northeast of Hargeisa. It looked different from other aloes in its distinctly red colour and in forming large, dense patches. (Plate # 6 on page 21). Further investigation on this species required.

1.1. Objective of the assessment

- a) Explore the distribution and diversity of the different species of aloes in the target areas of aloes and their population trends.
- b) Identify the threats facing that result from anthropogenic activities and some animals such as monkeys, porcupines and others.

¹ Review of the Significant Trade- East African Aloes (Nov. 2003)

² Max B. Skousen, *Aloe Vera, the Ancient Egyptian Medicinal Plant*, Aloe Vera Institute, CA, USA.

³ Review of the Significant Trade – East Africa Aloes, p. 3.

- c) Identify the economic potential of Aloes in improving the economic status of rural communities through creation of income generation avenues.
- d) Identify, analyze, and recommend opportunities that can create income from Aloe business for rural communities in Somaliland.
- e) Explore, and recommend appropriate strategies, and sustainable approaches to harvesting aloe vera as an income generation for rural communities.

The assessment was initiated by Candlelight for Environment, Education and Health - a non-profit organization, dedicated to development issues in under-served and/or marginalized communities in Somaliland/Somalia. The natural resource management sector of the organisation has made a formidable expansion since year 2000, whereby the organization carried out dozens of projects in the areas of soil and water conservation, sustainable agriculture, reforestation, alternative energies, climate change and awareness creation.

In a bid to diversify the source of livelihoods of target communities, Candlelight solicited funding assistance from Development Fund, a Norwegian non-governmental organization for carrying out the assessment.

1.2. Methodology

In carrying out this assessment, the consultant relied on the following sources of information and methodology to carry out the task:

- Published information from the internet
- Group and individual interviews with community members in the areas visited. Mainly they included pastoralists, community elders and women, as well as traditional healers, both in urban and rural areas.
- Field observations.

1.3. The Study Area

The current assessment was confined to five locations in Maroodi Jeex and Awdal Regions. The areas covered the Juniper zone of the Golis Range, and adjacent *Acacia etbaica* ecological zones.

Location	Region	District
Adadlay	Maroodi Jeex	Hargeysa
Gacan Libaax	Sahil	Mandhera
Alaala Cadka	Maroodi Jeex	Laas Geel
Dacawaley	Maroodi Jeex	Hargeisa
Borama	Awdal	Borama

3.0. Current and Past uses of Aloes in Somaliland

Following are some of its main as narrated by the interviewees during the focus group discussions:

Table 1

Use	Part Used	How Use	Who use
first-aid choice for treating burns, scalds and wounds.	Sap	The fresh sap is immediately applied on the wound and its soothing effect is experienced with a short period of time. It is also believed that it enhances the healing process by reducing infection.	Common practice
Anti-malarial	Sap	The young, growing soft end of the Aloes is chewed as a preventive measure.	Common practice
Eye care	Sap	It is used as an eye drop solution. The sap is sometimes diluted with water to reduce its acidity. It is best used for conjunctivitis treatment and many other ailments.	Common practice in the rural areas
Laxative	Juice from the leaf	The sap is used to treat constipation and for stomach ulcers.	Common practice/healers
Stomach ulcer & other gastro-intestinal problems	Sap and gel	Taken before meals	Common practice/healers
Hemorrhoids	Young fresh leaves	As a relief from hemorrhoidal itching and inflammation, a small part of a peeled leaf is applied on the painful parts and/or inserted into the rectum.	Common practice in the rural areas
Eczema	Sap	Sap can be applied directly on the affected area.	Common practice/healers
Hair Colouring	Dry leaves	Traditionally, young, unmarried men used to cut the dry leaves of an Aloe plant and burned in fire. Then the residual ash was diluted with water and applied to the hair. The application of the paste on the hair used to give light red color, which used to radiate under the glare of the sun.	Men, Marriage seeker

Anti-anthelmintic (livestock)	Sap	Sap diluted with water and administered to livestock as a treatment for intestinal parasites.	Pastoralists
Anti- Malaria	Dried leaf	Burning dried leaves at home	Rural and urban households
Livestock Feed	Stem	During droughts, the brush-like stem is bound, crushed and then feed with animals, particularly cattle and donkeys.	Pastorals
Erosion control	Whole plant	Rows of Aloe plants can serve as an effective cross-slope barrier to combat soil erosion and increasing water infiltration. The living hedges stabilize the soil, improve soil moisture regime, and re-charge groundwater indirectly.	Farmers
Honey production	Flowers	Bees make honey out of the nectar during the flowering phase. Children also enjoy sucking the nectar out of the flowers.	Common practice
Dyeing	Leaf ash	Water is added to leaf ash and the resultant material is used as a dyeing material of household goods.	Pastoral women
Somali New Year	Leaves/ whole plant	The Somali New Year festival, <i>Nayruus</i> (<i>Nowruz</i> in Persian), is greeted with ‘fire-lighting/fire-throwing’ (<i>Dab-tuur</i> in Somali) and hanging of a leaf of an aloe plant over the doorway entrance of homes. It symbolizes renewal and as a protection against malign influence.	Common practice in the rural areas
Demarcation of farms	The whole plant	Whole plants are lined on farm borders to root therein	Farmers and agro-pastoralists
Marking graves	The whole plant	Whole plant or plants are uprooted and put on graves to root therein. ⁴	Common practice
Poisoning hyenas	Leaf extract	<i>Aloe ruspoliana</i> Baker is used to kill hyenas by smearing meat with the leaf extract ⁵	Pastoralists

⁴ In the neighbourhood of Mecca, at the extremity of every grave, on a spot facing the epitaph, Burckhardt found planted a low shrubby species of Aloe whose Arabic name, *saber*, signifies *patience*. This plant is evergreen and requires very little water. Its name refers to the waiting-time between the burial and the resurrection morning (Source: Botanical.com – A Modern Herbal, by Mrs. M. Grieve).

4.0. Status of Aloes in Somaliland

The 1997 IUCN Red List of Threatened Plants records 15 species of *Aloe* as being rare or threatened in Somalia (see the Annex). Grazing by domestic livestock has been recorded as a threat to certain *Aloe* spp., such as *A. peckii* and *A. pirottae*. The removal of woody vegetation by grazing, has at the same time allowed the spread other unpalatable species such as *A. megalacantha* which has invaded extensive areas on plains surrounding Hargeisa.

Somaliland, and Somalia in general, is endowed with a high diversity of flora which include 3290 taxa, some of which are cultivated, others known only from a single specimen, and of the total, 744 (22.6%) are endemic to these areas. These species, in terms of diversity and endemism, are found in Somaliland and Puntland, with the least in the central regions.⁶

In Somaliland, until now, the utilization of the natural stands of Aloes have not shifted from the traditional use, compared to the indiscriminate harvesting of the commercial species for bitter gum production in Kenya and elsewhere in many parts of Africa. Instead, the current main threats are habitat destruction and fragmentation resulting from increasing human activities. These include rangeland overgrazing which drives non-traditional users of Aloes, such as monkeys and porcupines to derive nourishment from its stem. (See Plate # 1).



Plate 1: *Aloe megalacantha*, damaged by monkeys. Dacawaley, near Gacan Libaax
-Latitude-9:47:22.24 ,Longitude 44:47:12.49 (Photo: Ahmed Awale)

⁵ Tom Reynolds, *Aloes: The Genus Aloe: Medicinal and Aromatic Plants – Industrial Profiles* (p.9)

⁶ *Distribution of Plant Diversity in Somalia – Learning from the Flora of Somalia*. Garrett G. Billings, Dept. of Wildland Resources, Utah State University, and Mary E. Barkworth, Intermountain Herbarium, Utah State University.

So far, there are no conservation efforts and no recent studies, as well, carried out on the situation of the different species of the Aloe family, particularly those with high conservation concern (Annex I). An attempt to commercialize species of Aloes was made in 1958 in British Somaliland. Samples of aloes was dispatched by the office of the Department of the Natural Resources to a company in U.K. to ascertain its commercial viability, and if it would compete with the Curacoa Aloes, originally from the West Indies, as a source of aloin.⁷ Aloin is one main ingredient in body care products and laxative preparations.

A recent attempt (2012) to commercialize Aloes in Somaliland and add-value it, was made by a Somali entrepreneur in his base in Borama, Awdal region. He planted fields of aloes and procured machinery to extract gel and resin, and finally succeeded in producing shampoos and other cleaning materials. His products were seen in Somaliland markets till the end of 2014. Unfortunately he passed away and the venture died with his demise.

5.0. Opportunities and viability of aloes to support rural livelihoods

Experience elsewhere shows that collection of aloe resin constituted as a source of income for different communities in parts of the Old World. One of the most prominent collection areas of aloe resin in the Horn of Africa is the Island of Socotra, off the north-eastern coast of Somalia. The inhabitants of the Island have over many centuries been exploiting the Aloes and resins from other species such as *Dracaena cinnabari* (Dragon Blood Tree) as a reliable source of income. The products used to reach the Middle East, India and Europe. One particular species known for its good quality resin is *Aloe socotrina* (*A. Perryi* Baker), also found in the Somali peninsula. Aloe resins is popular in the alternative medicine and widely used in the Middle East for its wide-ranging uses. Even in the Somali region, where the practice the traditional medicine (enriched with mid-eastern medicinal practices) is gaining popularity, extracts from aloes are dispensed of by the mushrooming *Cilaaj* centres operated by “Islamic medicine men”. The spreading of poor quality medicine globally, also particularly affecting the communities of the low income countries is a prime contributory factor underpinning the ‘back to nature’ trend of utilizing herbal medicine.

In commercializing aloes in the Somali region, the socio-cultural and trade ties between the Somalis and the peoples in the Middle East and the geographic proximity of the two areas, makes the marketing of aloe extracts in these markets viable. This will add up to the age-old trade products exported from the Somali coast, such as frankincense and myrrh, to Middle Eastern destination and

⁷ Correspondence between A. J. Feuill, Director of the Department of the Natural Resources (British Somaliland), and A. T. Wheeler in UK. (14th April, 1958).

countries far beyond. The above-mentioned local traditional medicine sector could also absorb aloe extracts and hence provide income generating opportunities for the collectors.

In order to utilize this resource optimally, there is a need to disseminate the basic techniques of sap collection and converting it into resin. The collectors should also learn the ideal collection periods in order to harvest the maximum amount of sap. The resin is obtained by cutting the leaves at their base and letting the yellow, bitter juice drain out. Then the water is evaporated off for the juice by heat, and the resulting light to dark-brown mass is the resin. Another basic technique common in the Island of Socotra is to cut aloe leaves into small pieces, and cast into a pit made in the ground, well cleansed from filth and paved; there to lie to ferment in the heat of the sun, whereby the resin flows forth. Then the resin is put in skins, and hung up in the wind to dry, where it becomes hard.⁸ The sap can also directly be used for making soaps, lotions etc.

However, despite the economic prospects of aloes in Somaliland, its sustainable harvesting will be a challenge. As in the case of Kenya, where large quantities of aloes has been selectively harvested in the wild, bringing some species, for example *A. secundiflora* and *Aloe turkanensis* to a great decline, a similar scenario could materialize, if the necessary conservation measures are not put in place. The situation reached an alarming level whereby the former President of Kenya, Daniel Arap Moi, declared aloes as 'protected species' in November 1986 and decreed that aloes could be harvested only from plantations.⁹

In the light of the above, any future project aimed at orientating communities to harvesting aloes should consider the long-term sustainability of these species. Therefore, cultivation is the best option that could balance the purpose of obtaining income by communities, on one hand, and contributing to the sustainable harvesting of this important resource.

An important conservation strategy is to identify critically rare and endangered species and house them in a botanical garden for stock regeneration. Unfortunately, so far, there is neither a botanical garden nor relevant local capacities, be it technical, personnel or financial, for this to materialize in the foreseeable future.

6.0. Conclusion

The natural resource base of the region has been witnessing severe biological and species decline. The Somali population, particularly those eking a livelihood from the harsh environment, as a

⁸ *Origin and History of all the Pharmacopeial Vegetable Drugs, Chemicals and Preparations*, American Drug Manufacturers Association; Lloyd, John Uri, 1849-1936, pp 11

⁹ Oldfield S. *Review of Significant Trade East African Aloes*. CITES; 2003. PC14 Do. 9.2.2 Annex

result, are bearing the brunt of its effects that can be manifested in decline in the quality of life. Of the many coping strategies improvised by those communities to deal with the ensuing negative impacts, the rural areas are losing population to the main urban centres. Yet many others have adopted practices that are detrimental to the environment, for example charcoal production.

Given the richness in diversity and quantity of aloes in Somaliland and its economic potentialities on one hand, and the readily available market (locally and globally, particularly the Middle East) on the other, exploitation of aloes in a sustainable manner can be an avenue for job creation and income generation for the rural communities in the country – poor women particular.

However, despite the economic prospects of aloes, its sustainable harvesting will be a challenge. Wild collection/harvesting proved unsustainable and detrimental to the environment as in the case of Kenya, as noted in the preceding sections. Therefore, if a program on aloes commercialization is to be introduced, necessary conservation measures have to be put in place. Cultivation of aloes is now a major business in India, the West Indies, China, and many other countries. Also initiatives to intercrop aloes with maize did well in Kenya.

7.0. Recommendations

- In the light of the findings of the assessment, there is no doubt that exploitation of aloes can be a viable alternative source of income for many poor farmers and agro-pastoralists in Somaliland. However, caution has to be exercised in embarking on a program orientating communities to commercially utilize this important resource. A crucial step is to develop a strategy for the sustainable management of aloe species. This could be worked with either with the Ministry of Agriculture or the Ministry of Environment & Pastoral Development.
- The current main threats causing the decline in the diversity of aloes are habitat destruction and fragmentation resulting from increasing human activities. These include rangeland overgrazing which drives non-traditional users of Aloes such as monkeys and porcupines, and even cattle to seek nourishment from the stem of certain species. Therefore, it is high time that an in-depth assessment on the condition of the species that can be categorized as rare or vulnerable is carried out, and then to couple this with a plan for *in situ* and *ex situ* (i.e. outside their habitat) conservation. Unfortunately, so far, there is neither a botanical garden nor relevant local capacities, be it technical, personnel or financial for this need to materialize in the foreseeable future. The establishment of a botanical garden will pave way for the propagation and nurturing of many endangered plants including certain aloe species.
- The newly establish Herbarium in the University of Hargeisa should include the identification of threatened aloe species and recommend strategies for conservation measures.
- A small pilot project on aloe cultivation is recommended here in order to set groundwork for a future wider intervention into this area. The project components may include identification of

the most commercially viable species, multiplication of aloes from suckers, land preparation, spacing, intercropping with other cereal plants, planting and harvesting.

Annex I: The conservation status of Aloes found in Somaliland/Somalia

Table 2. Species of *Aloe* in Somaliland and Somalia. Scientific names are followed by Somali names, where known. Most of the information in the table, including the regions used to report distribution (N1, N2, N3, C1, C2, S1, S2, S3), comes from Lavranos (1996, 1999, 2006a, b).

*Information from Lavranos (2006b). Shading highlights species not known from elsewhere.

	Species	Distribution	Ecology	IUCN Red List Status
1	<i>Aloe albovestita</i>	N2 (Djibouti); Mait Pass, Sanaag region	<i>Juniperus</i> forest and shady rock faces, on limestone; 1400-2000 m.	Endangered B1ab
2	<i>Aloe ambigens</i>	C1; Dolobshiyo and Catoodi, west of Hobyo	<i>Acacia-Commiphora</i> bushland on steep limestone rock faces; about 250 m.	Endangered B1ab
3	<i>Aloe bargalensis</i>	N2, N3; Durbo, Baargaal, and Galgala	Hills and mountains, on limestone; 0-1100 m.	Near threatened
4	<i>Aloe bella</i>	N3; Yibirti gorge, between Hordio and Bargal	Coastal semi-desert with low shrubs and scattered low trees, mainly <i>Commiphora</i> , on limestone; 0-100 m.	Endangered B1ab
5	<i>Aloe breviscapa</i>	N2; Near Erigavo, southern edge of Cal Madow	Semi-desert, on gypsum; about 1400 m.	IUCN: Least concern BUT not found recently near Erigavo
6	<i>Aloe brunneostriata</i>	N3; Near Erigavo	Semi-desert flats on limestone; about 640 m	Critically endangered B1ab, 2ab
7	<i>Aloe citrina</i> ; Dacar Gabaray	C2, S1, S2, S3 (Ethiopia, Kenya; Bulo Burti (Buulo Burde)	<i>Acacia-Commiphora</i> bushland or dry forest, usually on deep sand; 150-700 m.	Least Concern. Sap used for eye diseases.

8	<i>Aloe cremnophila</i>	N2; Daalo	Cliff faces in <i>Juniperus-Pistacia</i> forest, generally above 2000 m.	Endangered D
9	<i>Aloe ellenbeckii</i> ¹⁰	S3? (Ethiopia, Kenya)	Accuracy of record for Somalia questioned by Lavranos	Least concern
10	<i>Aloe eminens</i> ; Dacar dheer, dacar dheer	N2; Surad/Daalo	<i>Juniperus</i> forest or evergreen bushland, on limestone; 1300-1800 m.	Endangered B1ab
11	<i>Aloe gillettii</i>	N3; Cal Misheed, Mountains, Puntland	Rocky slopes, on limestone with <i>Juniperus</i> in open <i>Commiphora</i> bushland; 1350-1650 m.	Endangered B1ab
12	<i>Aloe glabrescens</i>	N2; (Gar'adag/ Eil-Afweyn)	Semi-desert flats, mainly on gypsum or limestone; 800-1000 m.	Least concern
13	<i>Aloe gracilicaulis</i>	N2; North of Erigavo	<i>Juniperus-Buxus-Dracaena</i> forest; about 1250 m.	Endangered B1ab
14	<i>Aloe grisea</i>	N1, N2 (Djibouti); (Gacan Libaax, Sheikh Pass)	<i>Juniperus-Buxus</i> forest and scrub, <i>Acacia etbaica</i> scrub, frequently much degraded, on limestone or basement rocks; 151200-1700 m.	Endangered B1ab
15	<i>Aloe heliderana</i>	N2, N3; Iskushuban on the road to Qardho	Semi-desert on limestone; about 500 m.	Near threatened
16	<i>Aloe hemmingii</i>	N1, N2; Golis Range: Sanaag, Gacan Libaax, Sheih Pass	Semi-deciduous dwarf scrub on limestone; 700-1000m	Near threatened
17	<i>Aloe heybensis</i>	S1; Buur Heybe, North of Buur Xakaba, Southern Somalia	*Granite inselbergs	Least concern
8	<i>Aloe hildebrandtii</i>	N1, N2; Gacan Libaax	<i>Juniperus-Pistacia-Buxus</i> forest, on limestone; 1150-1700 m	Endangered B1ab

¹⁰ Thulin mentions this as a 'described species of uncertain position'.

19	<i>Aloe jucunda</i>	N1; (Gacan Libaax)	<i>Juniperus-Buxus</i> forest on limestone; 1100-1700 m.	Critically Endangered B1ab
20	<i>Aloe lindenii</i>	N2, N3; Tug Nugaal, near Las Anod	Eocene gypsum-anhydrite-limestone series in catchment area of usually waterless Tug Nugaal	Vulnerable B1ab
21	<i>Aloe luntii</i>	N2 (Yemen, Oman)	Semi-desert flats on gypsum; about 900 m.	<i>Not assessed</i>
22	<i>Aloe medishiana</i>	N2, N3; Medishi	Hillsides with small shrubs and succulents, on limestone; up to 1800 m.	Near threatened
23	<i>Aloe megalacantha</i> (' <i>Dacar Dhegweyn</i> ')	N1, N2 (Ethiopia)	Open, often degraded <i>Acacia-Commiphora</i> bushland, on limestone or sand.	<i>Not assessed</i> ; common in habitat
24	<i>Aloe microdonta</i> ; (' <i>Dacar Qaraar</i> ')	C2, S1, S2, S3; Jannaale, aw dheegle	<i>Acacia-Commiphora</i> bushland, usually on sand or limestone; 250-500 m.	Least Concern
25	<i>Aloe miskatana</i>	N3; Cal Miskeed, Bari Region, 20 km south of Qandala		Least concern
26	<i>Aloe molederana</i>	N2; Erigavo	Low desert scrub on gypsum; about 1450 m.	Critically Endangered B1ab
27	<i>Aloe officinalis</i>	N1, N2 S2 (introduced)	Cultivated	<i>Not assessed</i>
28	<i>Aloe orlandi</i>	N2; south of Yufleh	*Open desert in rocky, clay soil.	<i>Data deficient</i>
29	<i>Aloe parvidens</i>	N1, N2, N3, C1, C2, S1, S2, S3; (Qool-caday, Oodweyne)	<i>Acacia-Commiphora</i> bushland or semi-deciduous forest, on deep sand; 25-1300 m	Least concern
30	<i>Aloe peckii</i>	N2	<i>Buxus-Acokanthera</i> bushland with <i>Acacia etbaica</i> , on limestone; 1500-1750 m.	Endangered B1ab

31	<i>Aloe rabaiensis</i>	S3 (Kenya, Tanzania)	Woodland, coastal; about 120 m.	Least Concern
32	<i>Aloe retrospiciens</i> ('Dacar Budhuq')	N1, N2, N3 (Dacar Budhuq)	Rocky ground with shrubby <i>Acacia</i> and <i>Commiphora</i> ; 300-1100 m.	Vulnerable B1ab
33	<i>Aloe rigens</i> ; Daar Maroodi	N1, N2; Boon, near Borama	Grassy or shrubby flats, or <i>Acacia-Commiphora</i> bushland, mainly on basement rocks; 1200-1400 m	Least concern
34	<i>Aloe ruspoliana</i> ; dacar	C1, C2, S1, S2, S3 (Ethiopia, Kenya)	<i>Acacia-Commiphora</i> dry woodland and bushland, mainly on sand; up to at least 300 m.	Least concern. Poisonous to sheep, camel used t poison hyenas (Kuchar ??).
35	<i>Aloe scobinifolia</i>	N2, N3; Daalo	Stony flats with dwarf shrubs and grasses on gypsum or rocky arid slopes on limestone; 1100-1650 m.	Endangered B1ab
36	<i>Aloe somaliensis</i> ; Dacar biyod	N1;); Sheikh, Gacan Libaah (not known which variety)		Vulnerable B1ab (assessment for species; varieties not assessed)
36	<i>Aloe somaliensis</i> var. <i>marmorata</i>	N1 (Djibouti)	<i>Acacia-Commiphora</i> bushland on limestone; about 800 m.	
	<i>Aloe somaliensis</i> var. <i>somaliensis</i>	N1	Bushland and rocky slopes on limestone; 700-1000 m.	
37	<i>Dacar cas</i> (The Red Aloe)	N1; Alaala-cadka	Confined to a treeless plain between Alaala-cadka and Dhebi-hagood villages ; about 909 m.	Identity not known, possibly new

Table 2. Human uses of *Aloe* in Somaliland (Awale/Abdikani 2016). In only a few cases is it known which species are used.

Part	Use
Medicinal use	
Growing tips	Malaria prevention
Dry leaves	Burned inside houses as insect repellent
Peeled leaf	Haemorrhoidal itching and inflammation
Sap	Treat burns, scalds, and wounds
Sap	Eye drop solution
Sap	Constipation and stomach ulcers
Sap	Eczema
Sap	Intestinal parasites in livestock
Sap	Poisoning hyenas
Sap	Protection of animals against ticks
Cosmetic uses	
Ash from burned stems	Colour hair
Other uses	
Plants	Mark graves
Plants	Mark boundaries/hedges
Plants	Erosion control

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Plates



Plate 2 : *Aloe grisea*, Gacan Libaax camp. at coordinate of 9:52:12.48 – 44:49:50.87
(Photo: Abdikani Sulieman (left) Ahmed Awale (right))

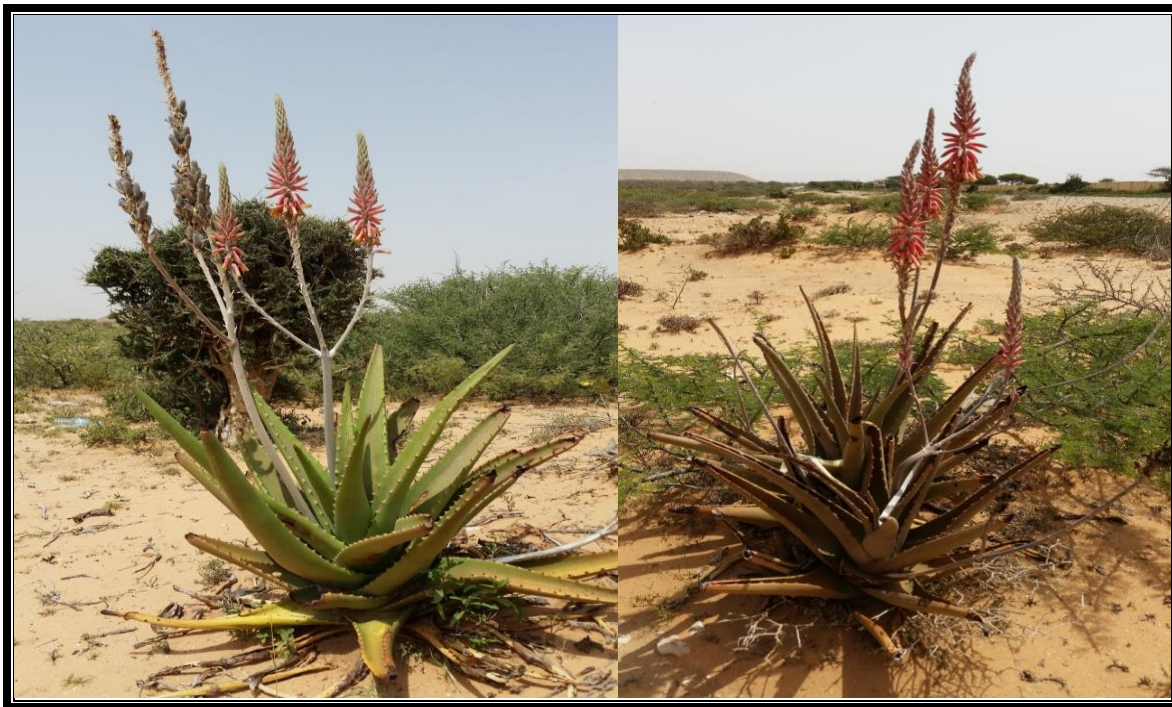


Plate 3: *Aloe rigens* ('*Dacar mardoodi*'), on a location between Haleeya and Aw Barkhadle, by the tarmac road from Hargeisa to Berbera. Nearby species are *Acacia. Edgeworthii* ('*Jeerin*') and *Boscia minimifolia* ('*Maygaag*'). GPS coordinates: 9:45:9.93 – 44:16:18.27 (Photo: Abdikani Suleiman)



Plate 4: *Aloe hildebrandtii*, Gacan Libaax camp. Note the creeping (almost 2 m) and rooting stem. GPS coordinates: 9:51:59.28 – 44:49:58.64(Photo: Abdikani Sulieman)



Plate 5: *Aloe grisea*, (Dacar Biyood) seedlings propagated in Gacan Libaax Nursery, where Candlelight maintains a forest management project. GPS coordinates 9:51:59.28 – 44:49:58.64 (Photo: Ahmed Awale)



Plate 6: Dacar Cas ('Red Aloe') at Alaala-cadka. Coordinates 9:52: 34.79 – 44:23: 2.10 (Photo: Abdikani Suleiman)