Somaliland Biodiversity Foundation

Golis Mountains ©Ahmed Awale

February 2017 Newsletter

In This issue

Where is *Aloe orlandi*? (1)
Hemidactylus somalicus (1)
Sharing knowledge (2)
Learning from local people (2)
Tortoises eating at night (2)
Assessing Frankincense forests (3)
Names (4)
Digital Audio Dictionary (4)
Roots of *Acacia bussei* (5)
Campus plants (5)
Biodiversity Museum (6)
Biodiversity Museum Online (6)
Geed-Deeble Reserve (7)
Sources (6)

Featured Species

Hemidactylus somalicus

For Mazuch, the search for *Aloe orlandi* had a good result. He found a gecko, *Hemidactylus somalicus,* that had not been seen since it was first discovered in 1932. He left happy!

Where is *Aloe orlandi?*

In 2006, John Lavranos described *Aloe orlandi*, a species discovered by Giuseppe Orlando three years earlier. In 2015, Tomáš Mazuch and his colleagues tried to relocate the species using the site's geographic coordinates and the tree in the photograph that was in the article. Despite careful searching, they did not find any plants of the Aloe. What could be the explanation? Mazuch suggested that the plants were present; he and his colleagues simply failed to spot them. He predicted that a more extensive survey would reveal other populations.

Then we asked Lavranos and Orlando for their opinion. They agreed that Mazuch was right; the plants were there but were too difficult to see. Orlando commented that "[Finding Aloe orlandi] is just a question of luck (and very sharp sight). Even the clump I found should still be there as only a couple of small offsets were taken to make them flower. Its unique habit makes it very difficult to spot until you literally step on it. Its very thick, water-storing roots allow its survival in those areas where rainfall is almost absent, and the leaves can almost disappear from the surface." Lavranos also commented that, with the current drought, the plants have "virtually withdrawn underground and [their] leaf-stumps are probably rendered quite impossible to spot …". Both suggested that searching in the rainy season will reveal more populations.

The original discovery of *Aloe orlandi* was unexpected. Orlando had not stopped because the area looked floristically interesting but to answer a call of nature. Considering his comments and those of Lavranos, we are planning to visit the area after the rains come. if we find more plants, we shall take a few cutting to cultivate at various locations in Somaliland.

Both Orlando's and Mazuch's discovery highlights the need to study areas that are "uninteresting". Perhaps they hide other, equally interesting plants and animals in this such areas. Even if no more new or little known species are discovered, knowing what is there will add to existing knowledge of Somaliland's biodiversity.

Where *Aloe orlandi* was found © Tomáš Mazuch

Sharing Knowledge


Ga'an Libaax, home to a remnant Juniper forest

The web gives access to more information every day but local people often know more about the plants, animals, and fungi around them than can be found on the web. This is partly because of their close and frequent contact but also because their knowledge is an accumulated and passed on from one generation to another.

This local or indigenous knowledge is often lost when families move to a new environment, whether a new rural environment, a town, or different part of the world. It may also lose value when the environment is severely degraded.

SBF aims to help save existing indigenous knowledge by connecting it with scientific research and using it to inform conservation efforts. In doing so, we shall seek to understand the scientific basis of traditional practices so that they can be used and adapted to help restore severely degraded ecosystems as well as maintain the health of those in good, or relatively good, shape.

Learning from Local People

The first step in learning how local people use the plants around them is to determine the scientific names of the plants involved. When Ahmed and Mary collected plants for the Biodiversity Museum in 2016, they were greatly helped Bixii Gurey.

Biixi came to Gacan Libaax at a tender age, few years after the British authorities in Somaliland started conservation work in the mountain. He was employed as a forest guard and acquired a wealth of knowledge about the mountain's flora and fauna. He is stationed at Candlelight for Environment, Education and Health camp and serves as a guide for visitors.

Bixii told Ahmed and Mary the Somali name for the plants they collected. Ahmed used this information to look up the scientific names. They then checked the descriptions in the *Flora of Somalia*. This last step is important because many Somali names have been applied to multiple scientific names.

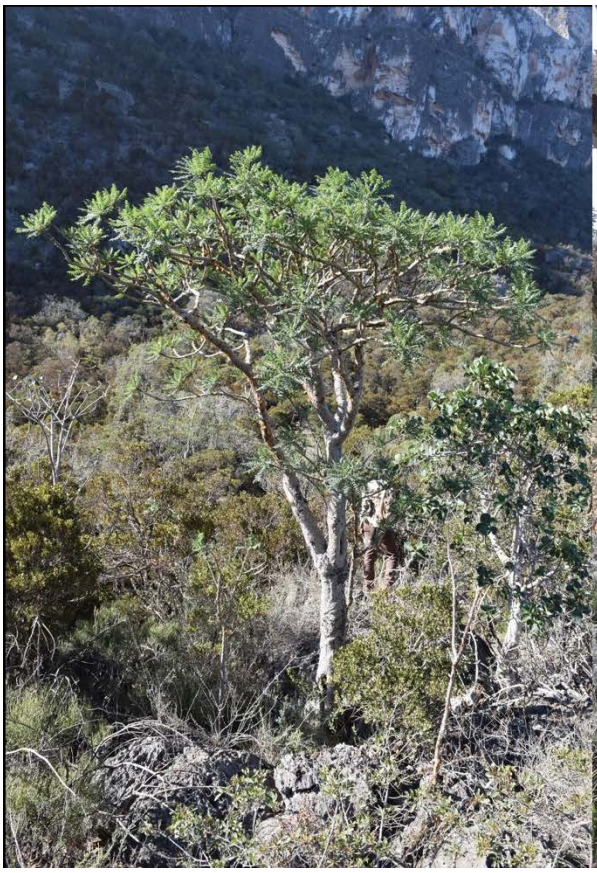
Tortoises Eating at Night

In November 2016, Awale received a call from a pastoralist who had come across a tortoise browsing on *Cissus* in the middle of the night. He sounded quite alarmed because many local people think that tortoises eating at night indicates a long drought. He asked Ahmed if he had heard of such a thing. Ahmed had not but, on investigation, learned that tortoises respond to hot dry weather by hiding underground or in thick vegetation and reducing their metabolic rate. They may come out and browse at night but this is dangerous if there are carnivores, such as Honey Badgers, that look for food at night. If they find a tortoise, they attack the back legs first. To reduce their danger, tortoises hide by backing into dense, thorny vegetation. Leaving to eat in the middle of the night, when it is cooler is dangerous, to be done only when desperate for food or the moisture that is in leaves. So yes, tortoises eating at night indicate that there has been a severe drought and local people believe it means the drought will continue.

Minimizing the effects of heat by hiding in cool places and lowering the metabolic rate is known as *aestivation*. *Hibernation* is common in temperate climates where animals need to avoid cold weather when there is no or little food available. Aestivating animals, unlike hibernating animals, routinely wake up and eat at night — but it is risky.

Assessing the Frankincense Forests

In January, Board Member Anjanette DeCarlo, Staff Officer Stephen Johnson, and forest ecologist Ahmed Derei led a second survey of Boswellia forests in the Sanaag region. These are the forests which produce the valuable frankincense resin. Their first survey in October revealed areas of significant over-harvesting and tree health decline but most of these areas were easily accessible from roads, and thus likely to experience greater harvesting pressure. The second survey included several remote sites where trees are less accessible and therefore harvesting might be less intense.



A healthy, well-managed tree

An over-harvested tree

They did find more over-harvested sites in the second survey but they also found some with healthy, well-managed trees. These sites—both relatively remote—had trees with the traditional 6-10 cuts rather than the dozens seen elsewhere, and displayed vibrant canopies and a high density of seedlings, indicating good reproduction. Unfortunately, one particularly remote site suggested over-harvesting is spreading: over-harvesting at the site had begun only two years ago. The trees were still healthy but observations at other sites and a review of the scientific literature indicate that continued over-harvesting will lead to a decline in their health followed by premature death. The trees naturally live to be hundreds of years old, but intense harvesting pressure may kill them within a few years.

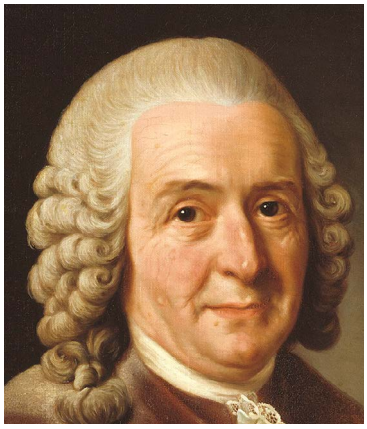
The work is not yet over; so far they have covered only about 25% of the major sites. They will be extending their assessment to other sites in the near future but the data are clear: if frankincense trees are to continue to be a major income source for local communities, over-harvesting needs to stop. If the traditional practices, in which trees receive 6 to 12 cuts per year for two out of three years, is followed, trees can remain productive for decades. But for this to be a viable option for today's harvesters, alternative sources of income need to be developed and international buyers need to work in partnership with clan leaders and harvesters in committing to sustainable buying practices and fair treatment for the harvesters.

For a report on their first survey, see newletter 1, page 2.

Names

People in all cultures name the organisms they encounter. These names are used to pass information from one generation to the next about, for example which plants cause or cure stomach pains or where a particular kind of animal is likely to be found. Scientific names are also used to transmit information but do so across the whole world, not just within a single culture. For this reason, scientific names have to be formed according to the internationally accepted rules laid out in *International Codes of Nomenclature*.

Linnaeus suggested some rules for forming scientific names in the 1700s but it was not until the early 1900s that the first, internationally accepted rules, or *International Codes of Nomenclature*, were accepted. Today there are five *Codes*, one each for animals, prokaryotes, and viruses, one for algae, fungi, and plants and one for cultivated plants. Each gives the rules that must be followed in deciding the correct name of organisms in its group(s), *once the classification has been decided.*



Linnaeus, the scientist whose works form the foundation of scientific nomenclature

Classification means deciding to which group an organism belongs, not just animal or plant but which species or subspecies. Initially, classification was based solely on an organism's appearance but, as new tools were developed, additional features were considered. Today classifications often reflect many different kinds of data.

When new data suggest a classification needs to be changed, some of the groups involved may need new names. These names must be formed according to the appropriate *Code* but if people do not agree with the new classification, they wll continue to use the old names. This is why there can be two (or more) accepted scientific names for an organism. *Acacia bussei* is an example. Today many, but not all, scientists refer to this species as *Vachellia bussei.* It can be confusing but it is important that scientific names incorporate new knowledge.

Digital Audio Dictionary of Plant Names

Somalis make extensive use of the plants that grow in their vicinity, giving Somali names to those they consider significant. Consequently, understanding Somali plant names is important to understanding existing information about plants in the Horn of Africa, the many references to plants in Somali literature and poems, and engaging with local people about the plant diversity in their area. Knowing the Somali name(s) for a plant can also be a useful step in determining its current scientific name.

Many print references give the Somali name(s) for a particular plant species but locating the information for all but widespread species can be time consuming. SBF is proposing to simplify the process by creating a downloadable online dictionary. The initial version will be text only. The text will include the name itself followed by a short sentence in English (scientific names) and Somali (Somali names). Audio files will be added in the second phase. These will provide a recording of a native English or Somali speaker reading the name and associated sentence. We shall use multiple speakers of each language to make the recordings so that users become aware that there are diffferences in pronunciation within each language. For example, is dandelion pronounced "**dan**dy lion" or "dan **dell** eeon"? Both are used in different parts of the world. The correct prounciation is the one your audience understands.

Root Architecture of *Acacia bussei*: adapted to drought

Acacia bussei [= *Vacchellia bussei*] or Galool may well be the most valuable species in the Somali territory for the people who live there. Every part of the plant has a use. The lateral roots are used to build the traditional Somali collapsible house or Aqal; the bark is used for robes, as a source of medicines, and for tanning, coloring and as a disinfectant; the stems and trunks are used for walking sticks, clubs, and the multi-purpose pastoralist's forked stick or hangool as well as for construction; the tender, young swollen thorns are edible; and the leaves are browsed by animals as well as being used for tea. On top of all this, *Acacia bussei* charcoal is considered the best charcoal.

Building a traditional Somali collapsible house of "Aqal". The hoops are often made from the roots of *Acacia bussei.*

Many *Acacia bussei* trees are being killed through over use but there is an additional factor contributing to their decline, the architecture of their root systems. In 1951, P.E. Glover found that the roots of *Acacia bussei* trees spread out laterally for 10-15 meters but grow no more than 30 cm deep. The lateral spread of their roots enables the trees to benefit from light rainfalls that do not penetrate far into the soil but, because the roots are so near the surface, they are easily damaged by trampling, soil compaction, and exposure through soil erosion. Glover concluded that this was why, in large areas with many dead trees, the majority were *Acacia bussei*.


Thorns of *Acacia bussei* are often swollen at the base. They are edible when young.

With susceptible roots, so many demands on their tissues, and long term drought, it is not surprising that *Acacia bussei* trees are dying at a disturbingly high rate. They are still listed by the International Union for the Conservation of Nature (IUCN) as being of "least concern" but that is because the IUCN considers the global picture. At a local level, efforts to conserve existing trees and plant news ones should be encouraged because it the local situation that directly affects peoples' well-being.


Acacia bussei on campus

Campus Plants

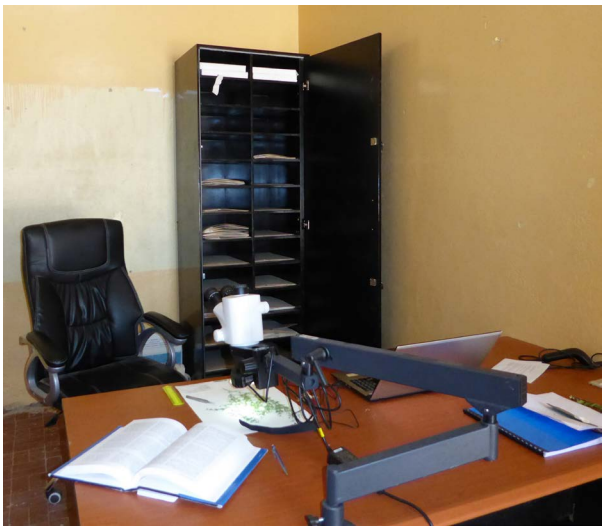
Representative specimens of the native tree species on campus have now been labeled. Students and foreigners unfamiliar with Somaliland's trees can now use them to help them understand what the names they read in reports and textbooks mean.

We shall also be using them to help develop resources for learning the meaning of words used to describe different features of plants, such as whether leaves are simple or compound. Students everywhere, not just in Somaliland, are easily overwhelmed by the number of words used to describe plants. Being able to show them examples on campus will make it easier; not easy, just easier. We are also planning to create a digital audio dictionary for such words using the same software developed for the names dictionary.

A typical label, this for the species also known as *Vachellia bussei*. The labeled tree is outside the library.


Juniperus procera on campus, transplanted from seedling grown from seeds obtained at Ga'an Libaax. The tree is outside the library.

Biodiversity Museum



The museum's facilities are growing. Notable acquisitions include a a herbarium cabinet, made locally, and a microscope on a long arm plus an attachment for taking digital images through the eyepiece. The herbarium specimens are now safer, because of the cabinet's tightly fitting door, and easy to find because the compartments make it easy to store the specimen folders in a logical order. The microscope makes it possible to study the specimens with out bending them — which would damage the plant material.

February also saw the addition of equipment for catching and studying insects. Some, such as collecting nets and aspirators, can be made in Somaliland in future but it is easier if there are samples to copy.

The Museum received several visits during February. Among the new visitors were the President of the University of Hargeisa, Dr. Mohamud Yusuf and its Director of Research, Warsame Mohamud; Daniel Frynta, František Kovařík, David Král, and Tomáš Mazuch, zoologists from Charles University in the Czech Republic; and Paul Evangelista and Nick Young, wildlife ecologists from Colorado State University, U.S.A. All complimented us on the facilities and discussed potential collaborations.

Biodiversity Museum Online

The Museum contributes to two websites, OpenHerbarium.org and OpenZooMuseum.org. There has been an increase in the number of records available through OpenHerbarium since the first newsletter and some gecko records from papers by Tomáš Mazuch added to OpenZooMuseum. Among the herbarium records are some cultivated species not previously documented as growing in Somaliland. Barkworth has also been adding descriptions and images to OpenHerbarium but the number involved is tiny compared to the almost 1800 species known from Somaliland.

More immediately useful, as a demonstration of what is possible, are checklists of the species of the University of Hargeisa Campus and the Maansoor Hotel, Hargeisa. A third, for Ga'an Libaax, has been started, using information from published sources and collections made in February 2016. All three checklists can be found by clicking "Flora Projects" on the home page for OpenHerbarium, followed by "Somaliland" and then choosing the appropriate list.

Checklists can be viewed as a list of names or as a series of pictures (click "Display as images", then "Rebuild List"). Clicking "Games" and selecting "Flash Card" generates a quiz like feature, asking for the name of the plants shown in a picture chosen at random from those available in the system for the species on the checklist. As will be seen, there are still many species for which there are no images. We are working on it! Eventually, it will also be possible to generate an identification key that is designed for the species on the list but that ability also takes times to build.

The checklists for the University of Hargeisa and the Maansoor Hotel are being built primarily to demonstrate how a checklist can be used to help students, field assistants, and others become familiar with the species growing in a small area. The images and identification resources they use come from files and information in the background database. This means that, as the database is developed, it will become easier to create immediately useful checklists. This is the power of information technology – it enables the use and re-use of resources and effort.

Sources

Cruz, J. Two people talking. Downloaded from clipartfest.com.

Glover, P.E. 1951. The Root Systems of Some British Somaliland Plants – IV. The East African Agricultural Journal 17: 38-50.

Lavranos, J.J. 2006. *Aloe orlandi*: a surprising new discovery from the Horn of Africa. Cactus and Succulent Journal 78(2):62-65. [Has pictures; not Open Access].

Roslin, Alexander. 1775. Portrait of Linnaeus, cropped from National Museum Press Photo and posted to Wikipedia.

The Future of the Geed-deeble Game Reserve

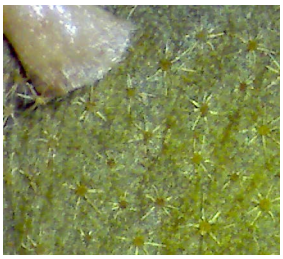
Geed-deeble is located approximately 37 km north of Hargeisa. Its water works are a main source of water for Hargeisa residents. During the British colonial days, the area was set aside as a game reserve with a rest house and it was also used as a recreational area by the residents of Hargeisa and other visitors. Clearly the site's unique qualities have been recognized for some time.

The dominant vegetation of the area is a remnant *Acacia tortilis* forest, unfortunately now being invaded by *Prosopis juliflora* - a species that was deliberately introduced to Somaliland with the best of intentions but has since become a major pest.

The area was frequented by Lord Delamere who made his first visit to Somaliland in 1891 to hunt lions. He returned annually until 1894 when he was severely mauled by an attacking lion, being saved from death by his Somali gun bearer, Abdullahi Ashur. Delamere later settled in Kenya. The protection and conservation measures that had been established for the reserve were continued until the breakdown of the Somali Government in 1991 but have since been compromised.

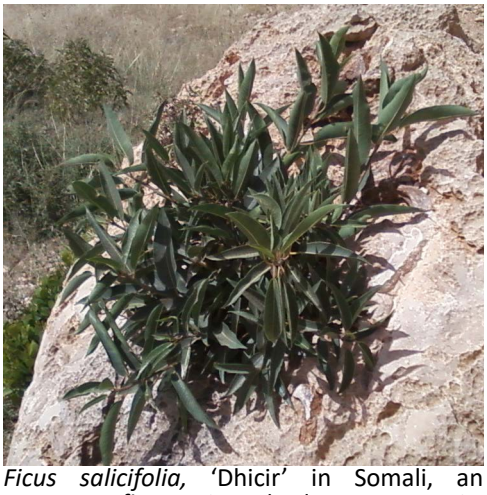
On Saturday February 20, Khadra Omer Hassan, the Chair of Barwaqo Voluntary Organization invited Ahmed Awale and Mary Barkworth, both of them founding members of SBF, to view the site because her organization is planning to develop a Botanical Garden and Preserve there, possiby funding from the Horn of Africa Regional Environmental Center and Network (HoA-REC&N). At its heart is an area of closed canopy woodlands surrounding some huge *Ficus sycomorus* trees. The shade and slightly higher humidity provide a sense of peace that is almost palpable. It is a sense that is enhanced by the children playing around the trees or, in the case of the young boys, sliding down the hollow interior of one of the trunks. There are goats wandering around, on the look out for the broad leaves falling from the fig trees whenever a light breeze shakes its huge branches. One goat, pretending it was a mountain goat, was climbing over the base of one tree to eat the leaves off a few unfortunate branches.

The Barwaqo Voluntary Organization plans to develop the site as an educational resource and a destination for visitors while aiding Somaliland's conservation and restoration efforts by raising young plants and evaluating and demonstrating effective gardening techniques. Part of the development process will include educating local people so they may share in the benefits of living near such a site. SBF strongly supports their efforts and looks forward to helping them idocument the site's biodiversity.

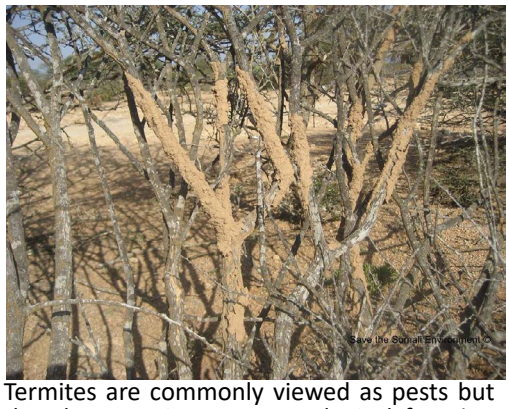


Stellate hairs and base of prickle on leaf of *Solanum schimperianum.*

Birds nests hanging from a *Ziziphus mauritiana* tree. In some bird species, males build many nests from which the female selects one; the others remain empty. This may seem like a lot of wasted effort but the low proportion of nests with eggs in lowers the attraction of the nests for potential egg predators.



Ficus salicifolia, 'Dhicir' in Somali, an evergreen fig species. The leaves are toxic, causing nervous disorders or even death in livestock.



Termites are commonly viewed as pests but they have an important ecological function being great decomposers. Termites break down tough plant fibers and wood, recycling dead and decaying trees into new soil, thus enriching it and increasing water infiltration into the ground.

Make Your Support Visible

Want to to make your support for the Foundation visible? Purchase items bearing the Foundation's logo, such as luggage tags, on Zazzle (https://www.zazzle.com/somalilandbiofdn) set up by Sandy Long. All royalties and referral premiums generated from such purchases will be donated to the Foundation. Purchase costs are not tax deductible.

Contact Information

Web Site: http://somalilandbiodiversity.org

Email: mary.barkworth@gmail.com

Mailing Address:
Somaliland Biodiversity Foundation
397 Lauralin Drive
Logan, UT 84321