



Somaliland Biodiversity Foundation

Entrance to the museum

Faisal Gelle

Newsletter 5

July 2018

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Plant Research Areas on Campus

This year the University of Hargeisa took a big step towards increasing the instructional value of its grounds, agreeing to set aside two areas as plant research areas. The first area, shown above, is in front of the university's Biodiversity Museum. It is being preserved as a natural area because it has retained good coverage by native species. The species themselves are not particularly noteworthy, but the area is exceptional because of its high concentration of native species.

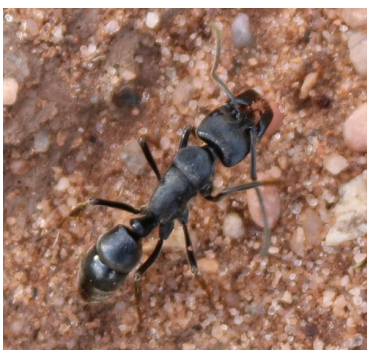
What has kept the area exceptional? One reason is that it has never received much traffic; of the two doors shown, only the black one, the museum door, is actually used. Another is that the area receives runoff from three sources: the building's roof, the road runoff, and a car washing service that takes place under the tree on the right of the photograph.

Setting the space aside as a research area means that future students can easily be shown what a native plant community might look like if protected from overgrazing. It will also become a focus for teaching environmental monitoring.

The second research area is still being developed. It is for growing and conducting research on native succulent plants and will be located across the street from the museum, against the eastern end of the north wall of the Institute for Peace and Conflict Studies building. Having such an area will make it easier to conduct research on the reproductive biology of such species and make their conservation and, where appropriate, restoration to native environments, practical. One of the first species to be included will be the Somali Red Aloe. It is not threatened, but almost nothing is known about its biology.

Featured Species

Paltothyreus tarsatus
African Stink Ant



Paltothyreus tarsatus [African Stink Ant] are large (17-20 mm long) ants. They live underground in colonies of 350-5000+ individuals. Like bee colonies, ant colonies have one queen, who lays eggs; several males; and lots of sterile female worker ants. Colonies of *Paltothyreus tarsatus* have multiple nesting areas, located 30-150 cm below ground level.

These are connected by tunnels 5-15 cm below the surface and hundreds of exit holes. One colony had over 130 m of tunnels and covered an area of 1200m². These allow a quick escape from predators and provide ventilation. They can build their own living quarters but may take over the living quarters of one of their favorite prey species, termites.

In addition to termites, *Paltothyreus tarsatus* eats other ants, insects, and earthworms. They forage mostly above ground, staying within about 5 m of an exit hole, but also eat burrowing animals they come across. They are called stink ants because, like all ants, African Stink Ants communicate with each other by smells but humans find their smell unpleasant. Presumably they themselves do not. For a video of *Paltothyreus tarsatus* in action, see the references.

Visiting Biyo-Guure



Location of Biyo-Guure shown by arrow.
Map prepared using Google Earth Pro.

Biyo-Guure is a water course that empties into the Gulf of Aden roughly 15km east of Berbera, Somaliland’s chief seaport. The stream originates in the Golis Mountains, after which it bisects a huge, sparsely vegetated, mountainous area. The name “Biyo-Guure” means ‘night running water’, because the flow of the stream increases when the temperature falls, as it usually does at night. A popular folk tale in the area connects the availability of the all year round water in the watercourse to a local saint who went by the name Sheikh Guure, who is believed to have ‘blessed’ the wadi; his grave is still venerated by pastoralists.

At its upper reaches, where the wadi narrows, water can be seen falling almost everywhere from the ravine’s walls, forming beautiful waterfalls. The first person to report on Biyo-Guure was Lieutenant Cruttenden of the Indian Navy and Assistant Political Agent at Aden. In 1848, he visited many parts of Somaliland including Berbera and the Biyo-Guure area. On his way between Berbera and Biyo-Guure, he caught many glimpses of the area’s rich wildlife including ostriches, koodoos (also spelled kudus) oryxes, and quaggs (zebras). Sadly, none of these can be seen any more on these plains.



Bacopa monnieri, hanging down the walls of the ravine.

In the past, the area had luxuriant riparian vegetation, offering good grazing to the cattle herders coming from the Golis Mountains during the cooler season. The water course still has many riparian species, such as *Schoenoplectus subulatus* (a sedge), *Saccharum ravennae* and *Phragmites karka* (Alalo or Chado and Gul bilanwe, large grasses), *Tamarix senegalensis* (a Tamarix) and an occasional *Hyphaene thebaica* (Timir, a kind of palm), but long stretches of the banks are occupied by the invasive weed, *Prosopis juliflora*.

One species still present today that both Lt. Cruttenden in 1848 and Richard Burton in 1854, commented on, is a peculiar plant, *Bacopa monnieri*. that hangs down the water-drenched ravine walls. It is still present today, attracting the eye of visitors.

A species that does not seem to have survived is *Dracaena schizantha* (Dragonblood Tree). Both Cruttendon in 1848 and

Richard Burton in 1854 noted its presence on the hills above Biyo-Guure. In early 2018, when I went on a short exploratory visit with Faisal Jama Gelle of the Somaliland Biodiversity Foundation and Helen Pickering, a volunteer from the Royal Botanic Gardens Kew working on a book on the plants of central Somaliland, we did not see it. A more extensive search may reveal some survivors but it does not seem likely because adult trees are usually conspicuous. Its numbers are known to be decreasing in the higher montane areas to the south of Biyo-Guure.



Close up of ravine wall. There are many species present, including *Bacopa monnieri* and several algae.

On the way to the hot spring, a small settlement, also called Biyo-Guure, lies on the bank of the watercourse. The hot spring, which can be accessed only by driving through the water-drenched river bed, has become a popular destination for those seeking healing from the hot water. Driving during the rainy season poses some risks of getting stuck as well as the risk of being swept away by flash floods.

Because of the difficulty in accessing the area and the prevailing harsh climate, the area’s flora and fauna are not well known. Discovering its flora and fauna will be worthwhile and rewarding. During my last visit there and looking up at the barren-looking hills, I jokingly told my colleagues that I wished I was twenty years younger!

Ahmed Ibrahim Awale

The genus *Euphorbia*

The genus *Euphorbia* has about 2000 species. They vary from ground-hugging annuals to large trees such as the mystery Euphorb (see story on right). Despite this huge variation, all Euphorbias have lots of features in common, including the production of milky latex when damaged and a photosynthetic pathway that helps them survive in hot dry climates, but the features that set them apart from all other plants concern their flowers and the way in which their flowers are grouped together on a plant.

Euphorbia flowers are reduced to the minimum number of structures for being considered a flower. They are unisexual, either male or female, and have no petals or sepals. Male flowers consist of a pedicel (stalk) that supports a single



A collection of cyathia. There is one central cyathium surrounded by 5 clusters of cyathia, with each cluster having 1 central cyathium surrounded by 3 other cyathia. The inset shows a single cluster. Image by Alvesgaspar, published on [Wikimedia](#) with Creative Commons licence BY-SA 3.0

stamen, female flowers a pedicel with a single ovary. But the feature that ties all species of *Euphorbia* together is the way in which the male and female flowers are clustered together or, to use the technical term, their *inflorescences*.

The inflorescence of a Euphorbia is a bowl- or cup-shaped structure called a *cyathium* (plural *cyathia*) Cyathia a cluster of several male flowers and one female flower.

The edges of cyathia are lobed. The lobes may be branched or look similar to petals, so similar the cyathia may look like flowers, not inflorescences. The shape and color of the lobes helps in identifying Euphorbias as does how the cyathia are grouped. Even this may not be enough. Often features of the

A Mystery *Euphorbia*



In February 2018, Helen Pickering and Faisal Gelle noticed a large tree Euphorbia while photographing plants in southern Somaliland, near Sallahley, close to the border with Ethiopia. Helen took photographs and, on her return to Kew, asked Mike Gilbert, a botanist with extensive experience in Ethiopia, whether he could identify it. He could not. Reliable identification of tree Euphorbias requires knowing what their leaves, flowers, and fruits look like. None of these were present in February.

In May, Faisal Gelle and Mary Barkworth visited the same tree, hoping to find leaves and flowers. Why the interest? Simply because it is such a striking plant. We found young branches and leaves, but no flowers.

They also became curious about the smaller tree Euphorbia growing to the right of the big tree. Although its small size might just be age, its young branches were more angular and its prickles distributed differently from those on the bigger tree. So they took photographs and sent all the images to Helen and Mike to see if either or both could now be reliably identified. The answer was still no. There are too many look-alikes.

What next? Helen is going to be in Somaliland in July, launching her book. *Plants of Central Somaliland*, at the 2018 [Hargeysa International Book Fair](#). During her time in Somaliland, she and Faisal will pay another visit to the two tree Euphorbs near Sallahley. Let's hope that they find flowers and fruits so that we can give them their proper names.

fruits and seeds need to be known. In *Euphorbia*, both vary in size and surface features. If there are only a few species of Euphorbia in an area, say 3-5, it may be possible to identify them from their overall shape and size. In areas where there are many species, such as Somaliland (59 species) and Somalia (77 species), reliable identification almost always requires knowing how the cyathia look and are grouped together plus what the size and surface of the fruits and seeds are like. Visiting them at the right time of year is essential for correct identification.

iNaturalist—Helping people connect with Nature

iNaturalist is one of the world's most popular free nature apps. It helps you identify the plants and animals around you by connecting you to over 750,000 scientists and naturalists around the world. People who register with iNaturalist can post pictures of plants, animals, and fungi to the site together with information on when and where the picture was taken, information that can often be taken from data associated with the image by your camera or cell phone. Of course, for the date and time to be accurate, they must be set correctly on your camera/phone.

Getting the latitude and longitude data, the “where” data, may be more difficult. A cell phone can be set to read the information from satellites.

Alternatively, make a note of your general location and, as soon as possible, find a computer and use Google Maps to find your location. Using satellite view makes it easier to zoom into where you were that the default view. Once you have found the location, right-click on it. A panel of options will come up. Choose “What’s here?”. This will show you the decimal latitude and longitude at the bottom of the page.



Using Google Maps to determine the latitude and longitude of a location. The left image shows the results of right-clicking on a location, the image, where the latitude and longitude are shown.

If you know the name of the species, or think you do, you can add it to your post but you can also post an image with a request for identification. The better the quality of your image, the more likely you are to get help. If you post a name, other people will either confirm your identification or suggest another one. It does have to be either the scientific name or an “approved” English language name, not a Somali name.

Clearly, if you want help in identifying what you have seen, your image(s) should feature the organism you are interested in and be in focus. I admit that I have uploaded two images that were not completely in focus. Despite that, they have been identified to genus (one was a bug, *Pachnoda*, another a butterfly, *Aloeides*). I do not know whether they could have been identified to species if my images had been in focus but knowing the generic name means I can look up more about these animals. Without their name, I could not. That is what is so useful about names—they open doors to additional information.

Horn of Africa Biodiversity

In May, a colleague and I established a project within iNaturalist “[Horn of Africa Biodiversity](#)”. This makes it easy to see all the observations from the Horn of Africa (defined by countries—so all of Ethiopia is included). We hope it will also encourage people in Somaliland and adjacent countries to submit good images to the site. This, in turn, will encourage experts to help out with identifications, something that will benefit all of us.

The reason for encouraging use of iNaturalist is that it will help well documented information about the distribution of different organisms. Records that are considered “research grade” can be imported into OpenHerbarium. What is a “research grade” record? One that includes information on when and where the image was taken and an identification that has been confirmed by two knowledgeable individuals. In this way, iNaturalist makes it easy to acquire, and help others acquire, knowledge about the species in an area. It is not much used in the Horn of Africa, yet. Let’s change that! Below, we issue a challenge—to upload images of some specific, easily identified species from as many different locations within the Horn of Africa as possible.

Ipomoea cicatricosa

Domer comis, Waxara-waalis



Helen Pickering

Ipomoea cicatricosa (shown above) is one of the species in our first mapping challenge (see p. 6). It can be recognized by its large (2.5-4.5 cm long), purple flowers and the scars left on its stems when its leaves fall off. The scars are referred to by its scientific name, “cicatricosa” being Latin for “leaf scars”. There does not appear to be an English name for it.

The scars are the marks along the stem in the picture on the right. To see them better, go to this [link](#), click on the picture and then select “view medium sized image”.



Helen Pickering

What are cacti?



Mary Barkworth

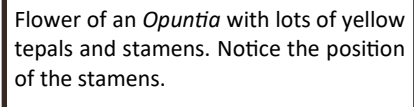
Cacti are plants with fat green stems, nasty spines, and no leaves, right? Yes and no. It describes cacti like those in the picture above, but also many plants that are not cacti.

What sets cacti apart are their flowers and the *areoles* on their stems. The flowers emerge from the end of a stem segment, are circular to look at, and have lots of colorful tepals (the term used when one cannot tell sepals from petals), lots of stamens, and a single style with a lobed stigma at the top.



Steve Ripple

Areoles are circular areas from which the spines, and often many smaller nasty stickies called *glochids*, emerge. All cacti have areoles even though some do not have spines or have them in only some of their areoles and some do not have glochids.



Flower of an *Opuntia* with lots of yellow tepals and stamens. Notice the position of the stamens.



Areoles. The plant on the left has glochids but no spines in its areoles; the one on the right has both spines and glochids.

One thing cacti do not have is a white or colorful sap so if you are looking at a spiny plant that “bleeds” white when poked or cut, it is not a cactus (cactus is the singular of cacti). If it has short

prickles or spines, it is probably a member of the *Euphorbia* family, possibly even *Euphorbia* itself.

So far, all the cacti seen in Somaliland have been members of the genus *Opuntia*. They always have glochids but some have more spines than others. There are other genera in Djibouti and Kenya.

A feature of cacti stamens is that they are *thigmotropic*. This means they move towards an object that touches them. To see this, simply poke your



Steve Ripple

Stamens after being touched.

finger in an open flower. When you remove your finger, you will see a fine yellow “dust” on it. This “dust” is made of pollen grains. When an insect enters a cactus flower to get nectar or pollen, the stamens react by moving so their anthers deposit their pollen on the insect. If the insect then goes to another cactus flower, some of the pollen will rub off on its stigma and fertilize its ovules, starting the process of seed formation.

Cacti are well known as a source of liquids in a dry environment. Humans cut a portion off and scrape out the innards. Some animals, such as camels, simply eat the pads but they prefer cacti with few spines. Even so, eating cacti can hardly be comfortable. The fact that camels can do so reflects their evolutionary history.

Cacti and camels first evolved in the desert regions of the Americas so camels, or rather the precursors of today’s camels, were better able to survive in deserts if they could eat cacti when nothing better was available. Camels, but not cacti, crossed the Bering Strait into Asia between 3 and 5 million years ago. Eventually their descendants made their way to the Arabian Peninsula and Africa. Throughout this region there were many plants they could eat, so the fact that they could eat spiny cacti was not important. Only when humans introduced spiny cacti to Africa and Asia, probably less than 1500 years ago, did their cactus-eating ability become useful. Indeed, it is probably more useful now than 100 years ago because of the increasing loss of vegetation in the areas where camels are kept and the increasing frequency of droughts. To watch a camel eating spiny cacti, click [here](#). It does not make me envy them their ability.

Why this interest in cacti?

One reason is that it is now clear that there are at least three kinds of cacti in Somaliland and none of them are the species included in the *Flora of Somalia*. The other is that cacti are easy to recognize as such, easy to photograph, and identifiable to species from a photograph taken at any time of year. For these reasons, they too are part of our first mapping challenge. See page 6!

Citizen Science – and a mapping challenge

Citizen science refers to the collection and analysis of scientific data by people who are willing and able to record specific data about a topic on a volunteer basis. Why would anyone contribute their time to a citizen science project? Some people do it because they enjoy contributing to a research project, others because the topic interests them, still others because they enjoy meeting, even if only via the internet, with people having similar interests.

What are the rewards of contributing to a citizen science project? People often end up learning far more about a topic that interests them than they knew at the start but projects can be designed to help develop more specific skills, such as new ways to use spreadsheet programs, conduct statistical analyses, or take better photographs. Participation can also enhance scholarship or job applications but, fundamentally, citizen science is about drawing on the power of people to add to existing knowledge about a topic by increasing the quantity and quality of data about it.

Citizen Science Project #1

Announcing: Somaliland’s first Citizen Science Project. It is a mapping challenge. The project’s goal is to find out detailed information on where one native plant species, *Ipomoea cicatricosa* [Domer Comis or Waxara-waalis], one group of introduced plant species, cacti, and, for animal lovers, one monkey species, the Hamadryas Baboon are found (see more on this page).

The plant distribution data will help in comparing the distribution of relatively undisturbed vegetation, represented by where the *Ipomea* species grows, and highly disturbed areas, which is where cacti grow. For the *Ipomea*, be sure to include a stem with leaf scars and a picture of the flower (see page 4). For the cacti, it is the flat surface of the stems that is important (see page 5).

The baboon data will be a major contribution. At present there

is only one record of the Hamadryas Baboon from Somaliland and Somalia in the Global Biodiversity Information Facility and it was collected is based on specimens collected in 1895. This project will use the power of people and digital cameras to make more information about the distribution of these animals widely available. They are known to be common in Somaliland but more documented information is needed. Today, good images with time and location data can provide that documentation.

How can you contribute?

First, register for iNaturalist. Then take your camera out and about with you so that, when you come across any of the three taxa (the *Ipomoea*, cacti, or baboon) take a photograph and post it, with locality and time data, to iNaturalist. If your cell phone is set to read GPS data, all the information the project needs (date, time, and location) will be uploaded with your image. Add the name of species (use the scientific name).

We also encourage schools and/or classes to participate. In fact, we would be delighted to see students in schools compete in providing high quality images from different locations.

The challenge

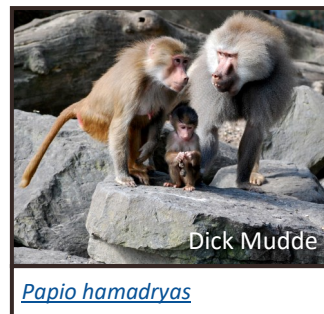
Our goal is to see 50 [research grade records](#) (see p. 4) from different locations for each of three targets (the *Ipomoea*, cacti, and Hamadryas Baboon) added to iNaturalist by November 1, 2018. If the challenge is met, we shall award 12 prizes, 2 in each of Somaliland’s regions. In each region, the school or class contributing the most records (must be at least 10) will receive \$50; the individual contributing the greatest number of records (again, at least 10) will receive \$25. We shall also award one individual and one school/class prize for records from neighboring areas.

People living outside the Horn of Africa are welcome to participate in the challenge but the prizes are for individuals and schools in in the Horn of Africa. They are welcome to nominate a school or class in the Horn to benefit from their prize money.

Monkeys in and near Somaliland

Old World Monkeys belong to the family **Cercopithecidae**. They differ most obviously from New World Monkeys in having nostrils that open downwards (like those of humans) rather than sideways. On [17 July](#) 2018, the Global Biodiversity Information Facility knew of only one monkey species in Somaliland, the Hamadryas baboon (*Papio hamadryas*), but there are three other species that approach Somaliland from the west: *Cercopithecis mitis* (Blue monkey), [Chlorocebus aethiops](#) (Grivet), and [Colobus guereza](#) (Mantled guereza).

This makes it important that images submitted as part of the challenge make it possible to sure which species was seen. It would be wonderful if the mapping challenge led to documentation that there is more than on monkey species in Somaliland.



Images of two species are on this page; the other two are on the next page. All four images are from Wikipedia and are published with a CC-BY-SA license (meaning they can be used



News from the Museum



The biggest news of 2018 is that July 21 will see the formal launching of *Introduction to Plants in Central Somaliland* by Helen Pickering and Ahmed Ibrahim Awale. It features superb



Jama Musse Jama, publisher, and Helen Pickering, lead author, discussing publication of *Introduction to Plants in Central Somaliland*.

photographs of 140+ species plus some great pictures of the main ecological zones in the area. A Somali version will be published later in the year.

Another milestone was registration of the museum's herbarium in [Index herbariorum](#), the international registry of research herbaria. Its code is now officially HARG. No other herbarium has, or will ever have, the same code. It is undoubtedly the smallest registered herbarium but registration was necessary in connection with formally naming the Somali Red Aloe. A manuscript proposing a scientific name for the species, and citing a specimen in HARG that demonstrates what the species looks like, was submitted for publication early in July.

The front page highlights another activity of the museum's herbarium: establishment, in conjunction with the university, of two plant research areas on the campus, the natural area shown on the first page and a succulent nursery adjacent to Institute for Peace and Conflict Studies. In addition, the university has built up the entrance to the herbarium and made additional changes to decrease the probability of another flood.

The herbarium of Quaid-i-Azam University in Islamabad, Pakistan (code ISL) helped solve another problem, drying plant specimens. Hargeisa is in the tropics, but it is sufficiently humid that drying plants requires blowing heat through a press. Attempts to purchase a forced air drier in Hargeisa met with

blank stares. The problem was solved when ISL donated two heaters to us. Islamabad becomes sufficiently cold in winter that people in the herbarium knew immediately what was needed and kindly donated two to HARG.

The ant on the front page will become part of the museum's insect collection but development of that collection has been delayed because of an unanticipated problem: inability to obtain glass of the thickness needed to construct insect trays.

A local company has built the cabinet and prepared drawers for holding the insects but, despite their best efforts, they have not been able to obtain glass of the right thickness for the tops of the drawers. Having glass is important because it means the insects can be studied without being removed. Insects are even more fragile than plants. At present, it seems that it will be necessary to have glass of the right thickness cut to the appropriate size and then packed very carefully for taking to Hargeisa.

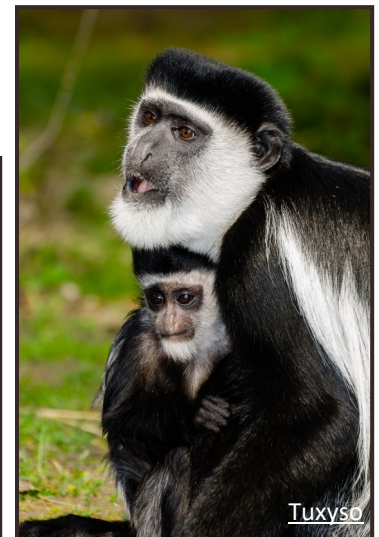
Monkeys in and near Somaliland (cont. from p. 6)

by others so long as the photographer's name is shown and that others using them, or derivatives, share them with the same conditions). The scientific names are linked to the original images. The photographer's name is on the image.



Charles J. Sharp

[Chlorocebus aethiops](#)



Tuxyso

[Colobus quereza](#)

Additional sources of information and images

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Faisal Jama Gelle, digging up a plant to make a specimen as part of the project on documenting the plants of the University of Hargeysa Campus.

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