



Somaliland Biodiversity Foundation

University of Hargeisa Campus

August 2022—Newsletter 9

In this issue

Editorial	1
University grounds as a resource	2
Active learning: effective, not easy	3
Needed: Teaching laboratories	4
Impact of rain on vegetation	5
LanderProsopis	6
Celebrating Somaliland!	7
Foundation news.....	8

Featured Species

Zaqiqah mucronata
Afrug, Gugangub



Zaqiqah mucronata, Afrug or Gugangub in Somali, is a grass of coastal saline areas near the Red Sea and Gulf of Aden.

Zaqiqah mucronata stands out for its combination of two rows of short, strongly angled, sharp leaf blades and its short dense. The white parts in the picture are bracts enclosing the flowers and anthers.

This spring, I gave a guest lecture in AGRI 223, Plant taxonomy. As part the class, I wanted students to examine living grasses with a hand lenses. The class had 35 students. Shortly before it started, the assigned room had 10 small tables and 10 chairs, chairs designed for note taking, not working with plants. However, when the class started there were seats for everyone because the male students had arrived with seats from another classroom.

The experience convinced me the Foundation should place more emphasis on helping improve the university’s teaching facilities. Because any actions relating to the University’s teaching program must be approved by its administrators, I asked Faisal to set up a meeting for me with appropriate individuals He did so, and we met at the end of the week.

The meeting* focused on my immediate concern, the lack of a teaching laboratory. The problem is that development of some specialized laboratories has been funded, but not laboratories for introductory classes. Because of the importance of laboratory experience, I committed the Foundation to providing basic equipment for a general purpose teaching laboratory. In return, the university promised to provide a suitable room for such a laboratory and to provide the museum with more space. We also discussed other items relating to the university’s teaching program, but our time was limited because I was leaving that afternoon.

I thank Faisal and Sulub for setting the meeting up at very short notice and for being given a copy of the University’s Strategic Plan for 2019-2024. The plan identifies areas where the goals of the Foundation and University overlap. I had met with each of those present before, but the joint meeting was an opportunity to discuss how to improve the interaction and has led to the designation of an official point person, Abdurasak Tahir Awale, the Dean of Agriculture, for further interaction, such as reviewing articles about teaching in this newsletter. I hope others left the meeting feeling it had value. I did.

Mary Barkworth, Somaliland Biodiversity Foundation

University Representatives: Mohamed Ali Hersi, VP Administration & development; Mohamed Ahmed Sulub, Director, Corporate Communications; Abdifatah Mohamoud Abdi, Dean of Applied & Natural Science; Abdurasak Tahir Awale, Dean of Agriculture & Veterinary Medicine; Ahmed Muse Duale, Head of Laboratory Department.

More than background — University grounds as a resource

A university' grounds can be a valuable resource for teaching, research, and public relations. The Foundation will be working with the University of Hargeisa to increase the value of its ground by: 1) increasing the number of different plant species present; 2) establishing environmental monitoring equipment; 3) integrating use of these resources into the teaching program; and 4) highlighting how these developments contribute to the university's mission.

Native and important species. A basic step in learning about plants is becoming aware of the plants that surround us, whether native or introduced. One can learn about species from words but observing living plants makes such learning easier and “more real”. SBF will help increase the number of species present, including introduced species being grown for food or medicine. and common weeds.

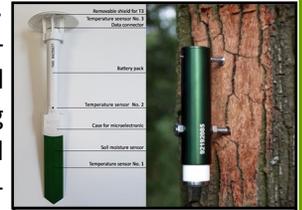


[Flaveria trinervia](#) or, in Somali, [Haramashle](#). A common weed in disturbed ground, including fields and fallow land in Somaliland, also present on campus. It is recognizable by its growth habit and 3 prominent leaf veins. The link is to a page in OpenHerbarium giving more information about the species.

We shall also develop an open access database to record when and where different species have been planted and the dates they reach different developmental stages and improve the [checklist](#) of campus plants in OpenHerbarium. The checklist provides easy access to pages in OpenHerbarium about the species listed, but some of the pages lack useful images and Somali names, a lack students could help address.

Environmental monitoring.

Current technology allows detailed tracking of environmental changes. Detailed? Recording data every 15 minutes for several years. Abdul Hakim Abdi will establish two kinds of environmental monitors on the University's grounds, a soil moisture sensor that also measures air temperature at and 15 cm above ground and a dendrometer that records changes in tree diameter of less than 1mm (see previous article).



[TOMST](#) [Soil moisture](#) (left) and [tree growth](#) (right) sensors.

After his field work this fall, **Abdul Hakim** will offer a workshop at the university on downloading and interpreting data from TOMST sensors established on the grounds. The participants will be encouraged to design and conduct small projects after the workshop. Doing so will give them experience in developing research proposals and reports.

Integration into teaching. Faculty and students will be encouraged to integrate resources available on campus into the curriculum and small research projects, for example, relating plant development to soil moisture and/or temperature; determining when the most flying insects visit a plant's flowers; comparing insect diversity on different parts of the grounds. Students engaged in such projects will be required to write a proposal, record and analyze relevant data, and prepare a written report and poster about their project. These will be valuable learning experiences and give students materials to enhance their professional portfolios.

Serve the university's mission: The initial developments will primarily serve the first part of the university's mission, “... fostering excellence in teaching and learning”. We shall invite faculty and students to short articles /presentations about their use of the grounds' resources for different outlets, including the university's development office, and to make suggestions as to how they can be used to serve the other parts of the mission statement: promoting innovative research, entrepreneurship, and community engagement.

Mary Barkworth

Active learning: Effective but not easy

Active learning refers to teaching a class in a way that involves students in practicing skills, solving problems, struggling with complex questions, making decisions, proposing solutions, and explaining ideas in their own words *during class time*. They may work together individually or in small groups, developing a response to questions posed before or during the class or developing their own questions about topics to be covered.

Studies in the US have consistently shown that active learning results in improved performance on examinations, particularly for students with poor academic backgrounds. Despite strong evidence that active learning is more effective than lecturing, a survey of such classes, also in the US, showed that lecturing is still more prevalent than active learning, particularly in large classes. Why?

[Scott Freeman](#), a leading advocate of active learning, has suggested several reasons, one being that it is not easy, not for the instructor for whom it is probably a new approach and requires a different kind of preparation, nor for students who are accustomed to listening, taking notes, and answering questions, often multiple choice questions on material presented to them, nor for those responsible for evaluating teaching effectiveness.

He and his colleagues have also found that if active learning is used only occasionally, it has little effect; if it is used a lot, performance changes. When asked why, he cited a colleague's "heads and hearts hypothesis". The heads part is that students need opportunities to practice using what they are learning. When an instructor is asking and not telling, students practice. The "hearts" part refers to developing a classroom culture in which students discuss ideas with each other and with the class as a whole and receive prompt, constructive feedback

both from each other and the instructor.

Want to learn more? A good place to start is with Beckie Supiano's interview with [Scott Freeman](#) and the links it contains. For suggestions on how to incorporate Active Learning into a class, Cornell University has a [website with lots of suggestions](#).

How would I rate my guest lecture?

Poor! I spent a lot of time preparing slides for a presentation, but none on considering how to encourage student engagement with the material presented. What could I have done better?

- Record my presentation and make the recording available ahead of time. This would have given the students time to study the content and form their own questions. It would also strength their English-language skills.
- With the recording, post questions based on its content. Some questions should be straightforward, others designed to encourage discussion.
- Prepare instructions to help students apply information in the presentation to living grasses .
- Require that, at the end of the class, they provide a page with a labeled sample of at least one of the grasses made available for study.
- Ask each group to compare one of the species studied with the other three.

Importantly, plan activities to promote active learning.

Mary Barkworth

Next year

Grasses are glorious!

Mary E. Barkworth,
Intermountain Herbarium, Biology Department, Utah State University;
Somaliland Biodiversity Foundation;
OpenHerbarium.org



One week before class, post narrated version of any planned presentation to YouTube for study by students and list some questions for them to consider as do so.

Note: Before the grass class, students should be able to:

- Use common descriptive terms for shapes and structures found in "normal" plant families;
- Use hand lenses;
- Use short dichotomous identification keys.

Needed: teaching laboratories



Room for a hands-on class in plant taxonomy 15 minutes before the start of class.

Introductory science classes need to offer students hands-on experience with the subject matter and the preparation of simple but clear scientific reports. Such experiences are usually integrated into a class's "laboratory" (aka "lab") time, the split between lab and lecture time being stated in the class syllabus.

At three US universities, the plant taxonomy class was worth 4 credit hours. Each allocated 2 hr/week to lecture but the number of lab hours/week was 4 or 6, offered either in a single session or in two sessions.

Currently, it is not feasible for University of Hargeisa to include lab time in many classes because it lacks the physical facilities required, particularly for introductory classes. What is required for *minimally* equipped introductory teaching laboratories?

The answer varies with the subject. Chemistry labs need benches with sinks, burners, a variety of glassware, and secure storage for chemicals. Biodiversity courses need tables or benches, chairs whose height can be adjusted, an equipment storage area, and equipment such as hand lenses, forceps, needles, single-edged razor blades, and rulers. The room should have two sinks and electrical and ethernet outlet and the tables should have electrical and ethernet outlets to for use with microscopes, scales, and laptop computers, as soon as soon as these can be acquired. Teaching labs also need secure storage for the

equipment of all classes taught in them.

The University has at least one room in its new laboratory building that could, with minor renovation, meet these needs; others rooms need more extensive renovation. What the University does not have are suitable tables and chairs for even one teaching lab.

The Foundation has already provided the sets of student equipment needed by plant taxonomy students, but they are rarely used

because of the lack of suitably furnished lab space. This summer, the Foundation committed to providing the tables and chairs needed for such classes.

Suitable chairs are easy to obtain locally, but the tables will have to be made to order. Purchasing from outside the country is possible but would involve substantial transportation costs plus a long delivery time. Fortunately, there is a local company able to build suitable tables, tables with an electrical and ethernet outlet at each position and tops resistant to damage by water and mild chemicals. Purchasing locally will minimize transportation costs, increase employment, and help improve Somaliland's economy, all highly desirable outcomes.



Room after arrival of the 35 students (two out of three groups shown). There was one microscope per group and one set of equipment per student.

Help Somaliland's students become scientists

You can help Somaliland's students become scientists by equipping a teaching lab. Computer science students write and test code as part of their courses. Science students need teaching labs so they can develop their ability to do science.

You can help develop Somaliland's students obtain a quality education by donating to the Foundation.

PLEASE DONATE NOW

The impact of rain on vegetation in Somaliland



Field photo (left) and satellite image (right) of an *Acacia-Commiphora* shrubland site (HWD) of the Hawd in southern Somaliland.

Changes in water availability affect vegetation growth throughout the year, but it is difficult to identify the effects, duration, and spatial impact of seasonal rainfall in semi-arid ecosystems without fine scale data. Earlier this year, I visited central Somaliland to inspect possible locations for establishing a pilot network of autonomous environmental sensors that will provide such data for this data-deficient region. I shall combine the data they record on soil moisture, soil temperature, air temperature, and tree growth with vegetation data from Copernicus Sentinel-2 satellites to assess the effect of water availability on plant growth throughout the year.

During my visit, I was able to visit four of the five planned sites. They lie along an elevation and rainfall gradient. Reaching them involved driving about 400 km, mostly in off-road conditions that were at times challenging even for our capable 4x4 vehicle. We had to abandon the fifth site because the poor roads meant it would take too long to reach it. Fortunately, my collaborators at Somaliland's Ministry of Environment and Climate Change were able to suggest a suitable replacement site further to the east but accessible from the main highway. We shall install the sensors there when I am back in Somaliland.

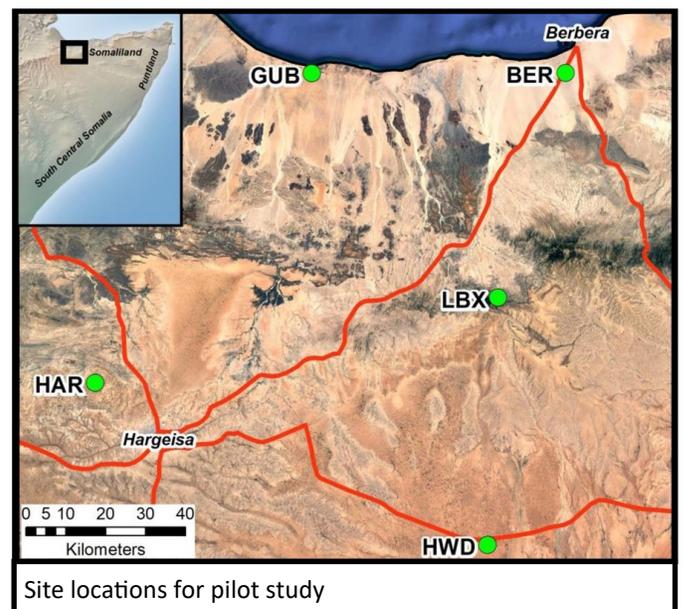
One site is a dense Juniper woodland that has suffered extensive dieback. Most dead trees are in the western part of the site and most living trees in the northern part. This summer, I shall place sensors in both portions. This will make it possible to look for possible

explanations of the greater dieback in the west. Between the two areas is a patch of *Dodonaea viscosa* var. *angustifolia* (Xayramad) growing on sandy soil that is otherwise devoid of a woody canopy. Sensors in this area will provide insight into how its moisture and temperature profile differs from the other two portions of the site.

I shall return to Somaliland shortly after the *Gu* rains to install the sensor network and begin data collection. I have also agreed to install sensors at the University of Hargeisa and to offer a workshop on their use as part of the partnership between the Foundation and the University.

AbdulHakim Abdi

<https://hakimabdi.com/blog/somaliland-scoping-trip>



LanderProsopis – sustainable Prosopis control

Prosopis juliflora [Garanwaa] is Somaliland's most serious invasive weed. It has taken over watercourses, roadsides, and disturbed areas. Satellite imagery indicates it now covers about 9% of western Somaliland. Wherever Prosopis grows, it replaces native vegetation with impenetrable thickets and reduces the water supply to nearby wells. Its thorns damage goats' feet and make grazing painful and its green pods rot a camel's teeth, resulting in death by starvation. No wonder pastoralists call Prosopis "The Devil's tree".

Several organizations have encouraged communities to control Prosopis by using its wood for charcoal and its seeds for animal feed, but their efforts have had little impact. Acacias are still cut down for charcoal and Prosopis continues to spread.

Guuleed Ahmed is taking a different approach. He founded a company, [LanderProsopis](#), that generates income from Prosopis by making and marketing high quality charcoal and other Prosopis products. He is using the income to expand the company by buying more equipment, hiring more employees, and clearing more areas.



Sorting Prosopis for the kiln

Guuleed's goals do not stop with [LanderProsopis](#). He has partnered with [MedicineAfrica](#) to form [ReSeed](#), a charity funded by the [J.A.C. Trust](#). ReSeed's goal is to create self-sustaining cooperatives to convert cleared areas into climate-resilient areas where Prosopis' regrowth is controlled by converting it to marketable products, agroforestry is promoted, and biodiversity increased by planting both native species and introduced food species.

[ReSeed](#) will train local people, in part by developing community centres with solar-powered televisions for showing educational and training videos, adding a Somali soundtrack or subtitles when necessary. The televisions will also be used to show recreational videos, but their primary purpose will be for education at multiple levels including, for example, basic arithmetic.

[LanderProsopis](#) and [ReSeed](#) are separate organizations but underlying both is recognition that, to be sustainable, initiatives must respect social, economic, and ecological principles.

The goals of [LanderProsopis](#) sound straightforward, but starting a successful company requires commitment, hard work, often including physical labour, and funding. So far, the funding has come [Welthungerheft](#), a German aid organization, Guuleed's savings, and family members. It now has one charcoal kiln up and running, and all its charcoal sold. The next step is to acquire the equipment and personnel needed to expand the company's operations to more areas in Somaliland suffering from invasion by Prosopis and extending the reach of ReSeed.



Guuleed Ahmed and Helen Pickering in front of kiln

Mary Barkworth

Celebrating Somaliland!



Helen (on right) and friend, dressed to celebrate.

On May 18 each year, Somaliland celebrates its independence from Somalia. By chance, Helen and I were in Somaliland for this year's celebrations. We were thinking of spending the day in the field, but that was not feasible. No soldier was free to go with us (a requirement for foreigners travelling in Somaliland) and Sa'ad, our driver, had young children who wanted to see the parade.

On May 17, we asked Sa'ad to drive us back to the hotel through the downtown area so we could see what was going on. It was hopping. Finishing touches were being applied to the stands for dignitaries, flags were everywhere, a few groups were practicing for the next day, vendors were selling a variety of items featuring Somaliland's colors (red, white, and green), and there was a general air of excitement because of the upcoming holiday. We succumbed to the excitement, purchasing umbrellas and other colorful items.

Helen suggested we could wear them for breakfast in the hotel the next day, but neither of us was completely convinced we would do it. Many of the hotel's guests were,

like us, foreigners, but some were Somalilanders, in town for the celebration taking place at the President's residence the next day.

I arrived first for breakfast, feeling both a little daft and a little nervous, sporting something or other, I forget what, in the national colors. Foreigners were somewhat bemused, but then one of the Somalilanders came over and, smiling, gave me a red, white, and green scarf. I relaxed. Then Helen came down, and soon it was evident Somalilanders were happy to see foreigners participating in their celebration.

Later we decided to walk around the neighborhood. It was very quiet, most of the males being elsewhere, but a few small stores were open, generally being run by women. Helen's relaxed enjoyment of people shone through. Next thing I knew, she was dancing with one of the women shop keepers outside the hotel, both with huge smiles on their faces, smiles that were echoed by those watching. After that, we continued our walk waving and exchanging greetings with the people we passed.

We had thought the day would be rather boring. It turned out to be the major highlight of our visit. We had fun, and the people we passed smiled and waved at us, clearly happy to see us sharing their celebration. Or, as Helen put it, "they enjoyed the fact that we were not too aloof and were happy to look a little silly".

Mary Barkworth



Memories of a fun day.

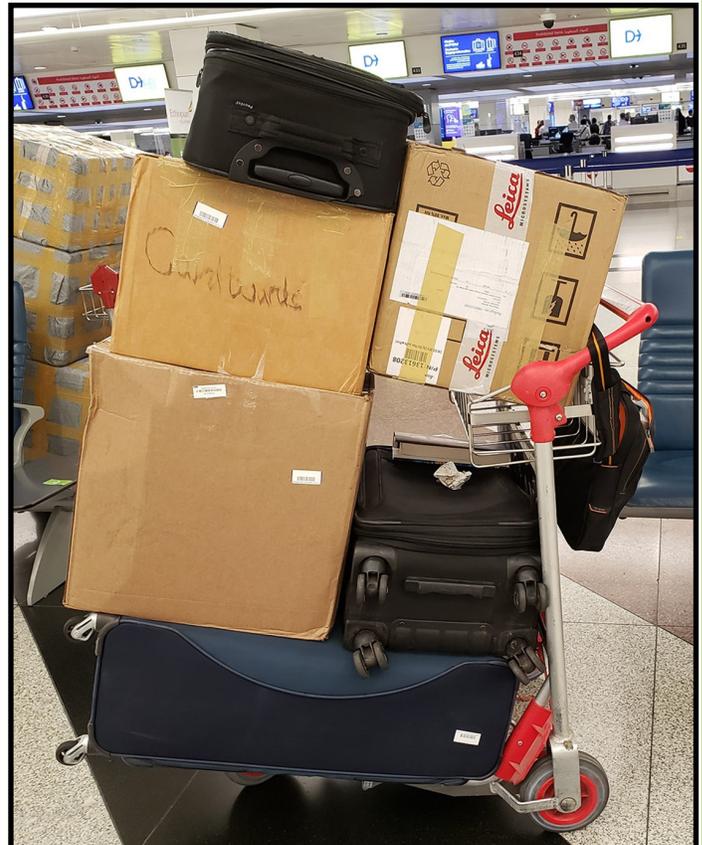
Foundation news

Growing the museum

Specimens: In August, 2022, the museum had 693 herbarium specimens, of which 465 have been identified to species. Most additions came from joint field work with Dr. Sebsebe Demissew of the Ethiopian National Herbarium and a donation of duplicates from that museum. Others were collected by Ahmed Awale and Faisal Jama in connection with a survey of [trees and shrubs pastoralists consider threatened](#).

In addition, Drs. Lorenzo Prendini (American Natural History Museum = AMNH) and Tharina Bird (DITSONG National History Museum of South Africa) provided us with data from the joint collecting trip in Somaliland in 2021. Their 218 records are now available via [OpenZooMuseum](#). Only 46 have been identified to species. This is normal when working with poorly studied groups from little known areas. Lorenzo's focus is [scorpions](#), Tharina's is [Solifugae](#). The specimens themselves are in AMNH and DITSONG because the museum does not have the resources to care for them. We shall update the records as the specimens are identified.

Equipment: The museum now has equipment for imaging herbarium and other specimens and a compound microscope with a built-in camera. The imaging equipment will enable us to ask experts outside Somaliland to assist us in identifying our specimens. In addition, to prepare for the insect workshop (see below) we provided the museum with more equipment for collecting and storing insects. I tend to have lots of luggage when flying to Somaliland.



Travelling to Hargeisa

Insect workshop

Workshops, particularly if they require both pre- and post-workshop engagement, are an effective way of covering topics not available through an existing course. SBF is sponsoring two workshops this fall, one on environmental monitoring (see p. 2) and one on insect collecting.

Dr. Tharina Bird will lead the insect workshop. It will last 5 days, with the first four days being at Daresalaam, which is near Hargeisa, and the fifth back at the University. The workshop will introduce participants to collecting, documenting, and sorting insect specimens. Some of the specimens collected will be used to start of the museum's insect collection.

Dr. Bird has taught at the University of Botswana and is now lecturing at the University of Pretoria in addition to being the Curator of Entomology at DITSONG. She has also offered workshops in Namibia and Botswana and has extensive collecting experience in many different African countries.



Imaging Center, set up for imaging herbarium specimens.

Mary Barkworth