

# Rwanda's Biodiversity Heritage

THE CENTER OF EXCELLENCE IN BIODIVERSITY  
AND NATURAL RESOURCE MANAGEMENT (COEB)

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Earth day 2021 at the National Herbarium of Rwanda  
(photo credit: Munezero Emmanuel)

Dear readers,

Welcome again to our monthly newsletter. We are glad to share with you the achievements of the Center of Excellence in Biodiversity and Natural Resources Management in April 2021. Despite the limitations imposed by the COVID-19 pandemic, the CoEB continued to collaboratively work with its nodes and partners to achieve its mission. Enjoy reading our news.

*Dr. Venuste Nsengimana,*  
CoEB Deputy Director

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## Rwanda Biodiversity Information System (RBIS): Working Towards a Milestone

One of the RBIS's milestones is to address comments, suggestions, and feedback from stakeholders. During a two day retreat at the University of Rwanda (UR) (April 1<sup>st</sup> – 2<sup>nd</sup>, 2021) the RBIS team was privileged to receive a visit from the Vice Chancellor of the University of Rwanda, Prof. Lyambabaje Alexandre. Keen to know more about RBIS and its functionalities, he was guided through the system by the team to demonstrate its capabilities, user-friendly functionalities, and, most importantly, the data available. Using the African fish eagle as an example, he was shown how one could easily query the system for the distribution of a specific taxonomic group or species. Excited to have an opportunity to demonstrate the multitude of quick and easy information that can be delivered by the system, the team was grateful for the Vice Chancellor's visit.

In his remarks following the demonstration, the Vice Chancellor thanked the team for the hard work and encouraged them to continue to improve RBIS further by utilizing stakeholder feedback. He advised the team ensure information is easily accessible and promised to support initiatives that the UR is adopting for the betterment of the community.

In addition, the team developing the RBIS visited the Department of Tourism and Conservation from the Rwanda Development Board (RDB) to discuss different issues pertaining to RBIS functionality and to brainstorm about how RBIS can be used to inform decisions regarding monitoring biodiversity in national parks and supporting tourism. In a roundtable discussion, participants strategized ways for the RBIS team to partner with RDB and continue the work to strengthen, capture, and maintain biodiversity data. In order to move forward effectively and efficiently, it was agreed that a memorandum of understanding (MoU) should be signed to formalize how the institutions will collaborate together to promote biodiversity research and tourism, as well as to assure that projects conducted by international researchers in Rwanda can provide a strong contribution to biodiversity data.



## Restore our Earth: Embassy of Israel Supports Youth training at the National Herbarium of Rwanda

In celebration of the International Earth Day 2021, the Embassy of Israel in Rwanda joined the Center of Excellence in Biodiversity and Natural Resource Management (CoEB) at the National Herbarium of Rwanda (NHR). This momentous occasion was the first ever organized Earth Day event to take place in the country.

Financed by the Israel Embassy, the event aimed at contributing to the development of NHR and the country's documentation and preservation of its rich botanical heritage. The two day event focused on building the capacity of UR students to research plants and included 18 post graduates and recent BSc graduate.

To promote research and help students better understand some of the techniques and methods used in the botanical field, students and lecturers from the UR, the Israeli Ambassador to Rwanda, Ron Adam and his team, were guided through Nyungwe National Park on April 21<sup>st</sup> where they received a hands-on training that focused on the collection of plant specimens. Thirty plant species were collected during the visit and served as a starting point for research on the role of plants in nature and other biodiversity.

During her opening speech, Prof. Beth A. Kaplin, the Director of CoEB thanked everyone for their support for the CoEB and their dedication to promote biodiversity conservation in Rwanda.

While opening the trainings at NHR on April 22<sup>nd</sup>, the Ambassador acknowledged that "one of the key areas of concern is the preservation of biodiversity and of the biological ecosystem on Earth. Humanity needs to preserve biodiversity which becomes more challenging in the current age of climate change and global warming".

At this event, the CoEB was also privileged to host the Director-General of Rwanda Environment Management Authority (REMA), Juliet Kabera, at the event. In her speech, she expressed Rwanda's commitment to preserving the environment and discussed the need for skilled youth able to implement the Government's environmental policies. As examples of Rwanda's efforts to mitigate and adapt to climate change, Kabera mentioned Rwanda's 2021 Green Growth and Climate Resilience strategy, as well national initiatives taken by the Government to determine the 2020 Nationally Determined Contributions (NDC).

Prof. Elias Bizuru, Research Associate of CoEB, Director of Research and Innovation and a lecturer of botany at the College of Science and Technology at UR, remarked that the trainings and field visit helped to build the capacity to monitor changes in plant species distribution in relation to climate change.



# Conserving Biodiversity and Training the Next Generation

The CoEB continues to train students and young individuals through the [NHR](#) and different projects managed by the center. From April 1<sup>st</sup>, the CoEB received 11 new interns. Three of them joined the team at the NHR, where they learned techniques used for plant field data collection and the herbarium management, specifically mounting, digitalizing and databasing collected specimens. The other four interns joined the RBIS team, and they were trained on biodiversity data management, data cleaning, mobilization of large datasets, and production of meta data. Further, two interns joined the team working on the zoological collection, where they received the training on the arrangement and preservation of specimens of birds, mammals and insects. The other two interns, working in the communication field, focused on outreach and biodiversity information dissemination through social media. They mainly focused on the use of the Arboretum forest and the effective communication of conservation information to the local community.



# CoEB Seminar Series Continues to Diversify



In an effort to continue to engage students, researchers, and professionals from around the world, the CoEB seminar series hosted a diversity of topics during April 2021. Four seminars were provided, including a presentation given by Providence Akayezu from the African Leadership University. She presented her research project on using sediment fingerprinting to identify erosion hotspots in a sub-catchment in western Rwanda. Another presentation was done by Venant Nzibaza, a research fellow and project manager for the Rwanda Biodiversity Information Project at the CoEB. He presented about stakeholder engagement in natural resource management. The following presentation was done by, Dr. Alphonse Guzha, a researcher from the International Union for Conservation of Nature. He presented the value and potential of a community-based approach to landscape restoration in the Sebeya catchment, Rwanda. Last but certainly not the least, was Dr. Catherine Watson, the Chief of Partnerships for CIFOR-ICRAF, who presented on an innovative approach to the conservation and enhancement of biodiversity through the use of grey infrastructure within cities and road verges, which have the potential to not only serve as repositories of biodiversity but improve human well-being.

Video recordings of the CoEB Seminar Series can be accessed here:

<https://www.youtube.com/channel/UCdr8ykoxB00DI7ywxpvBuWA>



# Soil-litter Arthropods as Biological Indicators of Soil Quality in Different Land Uses

Disseminating research findings



Dr. Venuste Nsengimana was awarded a research grant by the Royal Belgian Institute of Natural Science (RBINS) to support the dissemination of research findings for his project that focused on the use of soil-litter arthropods as biological indicators of soil quality under different land uses. Specifically, his findings center around (1) the diversity and abundance of soil-litter arthropods and their relationship with soil physicochemical properties and (2) the use of soil and litter ants (Hymenoptera: Formicidae) as biological indicators of soil quality. Data were collected in the Arboretum of Ruhande underneath exotic and native tree species, as well as in the Rubona agricultural research center under coffee and banana plantations. Findings indicated that the families of soil litter arthropods and the species of ants respond differently to land use and to soil physicochemical properties.

Beginning in April, the CoEB, in collaboration with journalists from Radio Salus began implementing an agenda to inform the public about the role of biodiversity and the often neglected invertebrate animals that occupy soil, including soil-litter arthropods. The target audience includes research institutions, the UR, local people and communities from areas surrounding the study area where data were collected. Data will be disseminated using a multi-media and multi-dimensional approach that includes the radio, publishing papers in scientific journals, and seminars and workshops led by researchers and graduate students. Further, the informational videos will be produced in English and Kinyarwanda, and they will be shared on the CoEB youtube channel.

## Post-graduate Highlights: Thacien Hagenimana

Studying plant-insect pollinator network topology across an altitudinal gradient in Nyungwe National Park



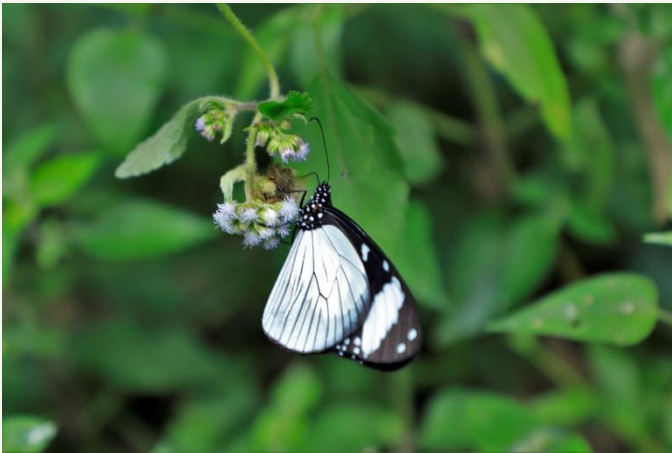
**Mr. Thacien Hagenimana**, a Biodiversity Data Manager and Research Fellow at the CoEB. Thacien is a master's student at both the African Institute for Mathematical Science (AIMS Rwanda) and UR-CST in Biodiversity Conservation and Natural Resources Management. Through his research funding from AIMS, Thacien is studying plant-insect pollinator network topology across an altitudinal gradient at Nyungwe National Park (NNP), Rwanda.

### **Why did you choose plants and their pollinating insects as your study area?**

Plant-insect interactions, especially pollinators, play a crucial role in maintaining ecosystem health as the vast majority of flowering plants (90%) are insect pollinator-dependent. However, this interaction is being threatened by anthropogenic activities such as deforestation that causes habitat loss and degradation, pesticide use; these in turn affect the network structure of plant-pollinating insects. Anthropogenic environmental changes also contribute to insect desiccation, phenological mismatches, and the alteration of insect nutrient contents, which significantly decrease plant and pollinating insect diversity and richness. While we see this issue around the world, there is a shortage of knowledge on this topic here in Rwanda. I, therefore, chose to study plant-pollinator insect interactions in NNP to gain scientific-based insights that can inform conservation and future research in Rwanda.

### **What does your research address regarding plant and pollinating insect conservation in Rwanda?**

My research aims to address knowledge gaps in Rwanda, such as the lack of data regarding insect pollinator diversity, specialization, and network structure, as well as how these aspects change over an altitudinal gradient. My research also aims to provide essential documentation about which insects serve as pollinators for Rwandan plant species and to contribute to Rwanda's zoological collection by expanding the number and diversity of species. By conducting this research, I hope to provide valuable recommendations that can help Rwanda to conserve the biodiversity of plants and insect pollinators to the benefit of ecosystem integrity, in addition to human livelihoods.



Top photos: plant-insect pollination interactions documented at the Arboretum of Ruhande; Bottom left: African stonechat (*Saxicola torquatus*); Bottom right: Rwasave wetlands (Photo credit Munezero Emmanuel).

The Government of Rwanda is committed to develop Centers of Excellence that will ensure research is available to meet national data needs for evidence-based decision making. University of Rwanda hosts several Centers which drive academic research and innovation in support of policy and management. The CoEB was formally established at University of Rwanda in 2016 and works across Colleges, Schools and departments in a multidisciplinary approach. It engages with environmental scientists, biologists, social scientists, policy scientists, gender experts, ecological economists, anthropologists, chemists, pharmacists, molecular biologists, foresters, agronomists, climate scientists, and many others. We work with youth and seniors, with government and private sector, communities, NGOs and international partners to meet our mission.

We are developing opportunities for youth and junior staff to gain experience, we provide data for decision-makers, we are creating an academic/research culture, and making it pleasurable. We are creating a dynamic and welcoming atmosphere for academics and practitioners, we want science and research to be enjoyable and rewarding, and we are driven to contribute to sustainable development goals and achieving climate resiliency.