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TRANSFORMING GENETIC RESOURCES INTO VALUE

eNewsletter Q1 2021

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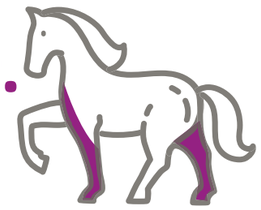

Editorial

Dr. Nadiya Al Saady
Mawarid

Amidst yet another row of Covid-19 pandemic situation hovering around the world in its seriousness threatening livelihoods and economy, we are bringing to you Mawarid's yet another newsletter for the first quarter of 2021 on the animal sector with interesting shortened articles, topics, personnel, news and events. Mawarid as its mandate hitherto deals with the significance of selected animal genetic resources that include domesticated and wild animals, and insects groups, keeping its coverage open.

In a recent report, it is projected that the world's population is growing from current population of 7.7 billion @ 32% to 9.5 billion by 2050 and @ 53% to 11 billion by 2100. As the most world's arable land is already in use, and water and energy also are limiting factors, increased food production will require a substantial increase in efficiency of not only crops of food and agriculture but also of domestic livestock animals towards achieving food security in terms of their valuable contributions to agricultural sustainability and the high nutritional value of products in the diet. In this respect, Mawarid's incoming "Conservation, and sustainable use strategy for domesticated animal genetic resources of Oman" with its' summary of milestones as one of the contents of this Newsletter is very relevant and worth reading. In addition to this, considering Insects as one of the most important groups that affect the life and welfare of humans in many ways, an account of Mawarid's ongoing efforts in establishing arthropods gene bank seems interesting to the readers. Further, you will find Mawarid's animal database with huge records on Oman's indigenous domesticated animals, birds, arthropods, wild animals and herptiles and conserved blood/DNA samples indigenous cattle, gazelle and sheep, and dried specimens of insects. In addition, the newsletter offers you the collective list of important past, present and incoming animal projects that reflect Mawarid's commitment and active involvement on conservation of indigenous animals for their future application for the welfare on mankind.

Mawarid's Animal Research Assistant Eng. Aflah Mohammed Humaid Al Jahdhami is the subject of our regular under the microscope feature and the intellectual team of I VIU is this quarter's Omani Genetic Resources Hero. And as always, we round up our e-Newsletter by sharing all our recent news.

We hope you will enjoy the read. Stay well, stay healthy and care for those around you!

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In a recent report, it is projected that the world's population is growing from current population of 7.7 billion @ 32% to 9.5 billion by 2050 and @ 53% to 11 billion by 2100.

Mawarid Animal Project 1

Conservation and Sustainable Use Strategy for Domesticated Animal Genetic Resources of Oman

Oman has a rich diversity of domesticated animal genetic resources. This is part of national heritage and its conservation and sustainable development and utilization require a national strategy.

Themes
Policy and Advisory

Program name
Strategic Priorities for Genetic Resources

Description
Oman has a rich diversity of domesticated animal genetic resources. This is part of national heritage and its conservation and sustainable development and utilization require a national strategy. A successful strategy will benefit current and future generations and will help Oman to meet its international obligations to protect global biodiversity. Worldwide, many countries have developed strategies of this kind. Formulation of a strategy for Oman can therefore draw on experience elsewhere but must be precisely tuned to Oman's conditions. This project will generate an effective and sustainable strategy, which will be presented in the form of a publishable Strategy Document.

Objective
1. To generate a sustainable strategy for domesticated animal genetic resources in Oman
2. Developing a regional action plan for conservation and utilization of the domesticated animals in Oman

Key Dates Timeframe
1. Submission of the Strategy Document Outline
2. Presenting the Feedback Workshop
3. Submission of the Strategy Document draft
4. Submission of final agreed Strategy Document and the Arabic Executive Summary
5. Submission of the Consultancy Report

Collaborators (Individual/ Organization)
1. Subul Business & Consulting
2. Royal Court Affairs
3. Royal Oman Police
4. Ministry of Agriculture Wealth, Fisheries And Water Resources
5. Sultan Qaboos University
6. Environment Authority
7. Oman Food Investment Holding Company
8. FAO
9. Dr. Ali Lawati, Nizwa University
10. Others

Others

Sponsorship
Mawarid

Key Mawarid Team Members
Dr. Nadiya Al Saady
Dr. Ihab Shaat
Dr. Saleem Nadaf
Asila Al Naabi

A successful strategy will benefit current and future generations and will help Oman to meet its international obligations to protect global biodiversity. Worldwide, many countries have developed strategies of this kind. Formulation of a strategy for Oman can therefore draw on experience elsewhere but must be precisely tuned to Oman's conditions.

Target Audience
Researchers/ students/ interested stakeholders/ institutions

Achievement/ Impact/ Outcomes
1. Third draft of the strategy documents was revised.
2. A second workshop was held with participants from different organizations, institutes and the private sector.
3. The main objective of the workshop was to develop the action plan for conservation and utilization the domesticated animal genetic resources of Oman.
4. Fourteen points were agreed to cover the entire action plan.
5. Feedback was received from all participants and stakeholders to define the Priority for each point and the duration.
6. The final draft will be ready by June 2021.

Follow up/ Actions
Submission of the final draft and the consultancy report of the strategy

Mawarid Animal Project 2

Establishment of Arthropods Gene Bank in Oman

Arthropods have a key role in maintaining ecosystems health, providing livelihoods and nutrition to almost all living organisms and vital environmental changes indicators.

Themes
Conservation

Program name
Ex situ Conservation

Description
Arthropods have a key role in maintaining ecosystems health, providing livelihoods and nutrition to almost all living organisms and vital environmental changes indicators. A number of arthropods affect economically important plants either through direct attack or indirectly by transmitting viral and bacterial diseases to the plants. Usually, arthropods are identified via their morphological characteristics. However, this approach is challenging due to the natural variability in the phenotypes within species as well as the limitation of the available morphological data. To overcome this problem, DNA barcoding needs to be combined with the species morphological identification.

Objective
1. Maintaining the genetic diversity of the most socioeconomically important arthropods samples
2. Producing a catalogue of arthropod species in Oman
3. Establishing a database of arthropod species in Oman

Key Dates Timeframe

Phase I:
1. Purchase the consumable items for morphological and molecular identification
2. Identify species based on morphological taxonomy
3. Preserve the species samples using different techniques
4. imaging of specimens
5. Develop a database
6. Identify the species using molecular method
7. Writing the report

Collaborators (Individual/ Organization)

Natural History Museum

1. Dr. Ali Al Wahaibi, Mr. Ali Al Raeesi, Dr. Riaz Shah and Dr. Salama A-Humaidi (Sultan Qaboos University)
2. Mr. Khalifa Al Haji, Mr. Said Al Rashdi and Mr. Nasser Al Rahbi (National Field Research Center for Environment Conservation)
3. Mrs. Azza Al Jabri and Ms. Shaikha Al Shukaili (Natural History Museum)
4. Mr. Ali Al Raeesi, from SQU

Key Mawarid Team Members
Dr. Ihab Shaat
Asila Al Naabi
Zahra Al Shabibi
Aflah Al Jahdami

Global Edible Insect Market

~$ 1.5 BN USD

by 2026

Reference: Global Market Insights

Target Audience
Researchers/students/interested stakeholders

Achievement/ Impact/ Outcomes
1. More than 350 samples of arthropods were prepared, these samples came from 44 species and 3 families.
2. All the information about the collected samples (order, family, species and size) were entered and saved in Mawarid database.
3. Five boxes are ready with labels to preserve them in the gene bank

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Follow up/ Actions
Continuing to identify the most socioeconomic target species in Oman

Explore potential industries
- Food
- Protein
- Pharmaceutical
- Beauty

Animal Database

Establishing Database of Animal Genetic Resources

2021
Current Species and Number of Records of Animals in the Mawarid Database

	Species	Records
Domesticated Mammals	8	57
Birds	491	1037
Arthropods	1452	2859
Wild mammals	44	413
Herptiles	95	107

2021
Current Preserved Samples of Animals in the Mawarid Gene Bank

	Cattle	Gazelle	Sheep	Dry insects
Blood and DNA	-	63	140	227
Semen straws	2200	-	-	

Animal Projects

1. **Genetic Diversity and Conservation of the Arabian Gazelle Populations of Oman**

2. **Establishment of Arthropods Gene Bank in Oman**

3. **Genetic characterization of Omani sheep breeds using DNA markers**

4. **Conservation and Sustainable Use Strategy for Domesticated Animal Genetic Resources of Oman**

5. **Establishment of an Equine Sperm Bank for preserving the Valuable Native Arabian Stallion Genetic Material in the Sultanate of Oman**

6. **Establishment a Gene Bank for the Ex Situ Conservation of Animal Genetic Resources in Oman**

7. **Phenotypic and Genotypic Characterization of Cape Hare (Lepus capensis) in Oman**

Under
The Microscope

Aflah Mohammed Humaid Al Jahdhami
Animal Research Assistant, Mawarid

When did you join Mawarid?
I Joined Mawarid Center on 5th of January, 2020.

What attracted you to a career at Mawarid?
Mawarid has multiplicity of initiatives and projects in animal sector with special reference to entomology in which I have a very special interest and this fact attracted me to career at Mawarid..

What do you like most about your job?
Working in something new helps me to improve my abilities to undertake research and access to obtain the information on the research subject. Also, I would love to go with collecting missions of Mawarid in the natural habitats to collect the samples and contribute to their conservation.

What is your typical routine of the day during your work?
When I'm in the center I attend to my routine work on database accumulation for three days / week and for remaining two days, I am involved in classification of arthropods at Entomology lab of College of Agriculture & Marine Sciences of Sultan Qaboos University..

What three words would you use to describe your job?
Search, Classification and Conservation.

You do a substantial amount of work on the arthropod project of the Center. Can you tell us something about it, why it is important?
The main aim of this project is to study the diversity of arthropods in Oman and to preserve both specimens and molecular materials in a gene bank towards producing a catalogue of arthropod species in Oman.

It is important because number of arthropods affect economically important plants either through direct attack or indirectly by transmitting viral and bacterial diseases. Also, arthropods damage about 30% of agricultural, forestry and livestock production resulting in significant economic losses yearly and it could affect human lives by acting as disease vectors or harming them due to biting, stinging or feeding on blood and tissues. Also, arthropods have a key role in maintaining agricultural ecosystems through pollination, predation, parasitism and decomposition of organic matter.

What other project or projects are you working on now?
I am working on the following other projects
- Genetic characterization of Omani sheep breeds using DNA markers.
- Establishing Database of Animal Genetic Resources.
- Establishment Ex-Situ Gene Bank for Conservation of Animal Genetic Resources in Oman.

Your specialist area is entomology. What drew you to this area in particular?
Small things and great diversity do have a great impact, whether negative or positive for humans, plants and animals. Nice colors with great details attract me to this area of study.

If you could choose entomology subject or aspect to research, what would it be and why?
I think my choice will be the insect pests that attack the date palm , which is one of the important and economic trees in Oman, The date palm is attacked by many pests like, red palm weevil, Dubas Bug, Fruit Stalk Borers, Lesser Date moth, etc.

Have you in mind any other interesting field of study?
Yes, designing gardens and parks focusing on ornamental plants and also business administration.

What do you think is the greatest threat to our environment?
People themselves.

What do you think is the single most important thing an individual can do to help conserve and protect Oman's genetic resources?
Firstly, by raising the awareness of the importance of genetic resources and on why we have to conserve them. Secondly, by showing the community the useful products from these resources. Besides, I feel that everyone should inform the concerned authorities when witnessing destruction of genetic resources to protect them. Certainly, these points can protect Oman's genetic resources.

"Small things and great diversity do have a great impact, whether negative or positive for humans, plants and animals. Nice colors with great details attract me to this area of study."

Omani
Genetic Resources Hero

"Transferring traditional solutions to another level of efficiency››

It is very interesting to know unique name of your company I VIU. What is your vision?
Our vision is to become one of the leading companies that provide unmanned vehicles and AI services in Oman

What is the story behind emergence of your company?
Yes. There is big story or background for establishing this company. At the time of submission of our final year project in the college of engineering at SQU, we began to prepare a project with a challenge to make it selected. Then, we formed our team with all seriousness and come out with an idea involving artificial Intelligence (AI) involving the supervisor. Such unique idea of using AI emerged from intelligent members of our group. After we submitted our project, Many institutions, governments, and corporations were thinking of thinking the idea into consideration in their fields. Then our members began with an idea of opening the company in many fields for artificial intelligence solutions using robotics and UAVs. Eventually we ended up with establishing this company.

Your company has a claim to provide unmanned vehicles and AI services. Can you elaborate the nature of these services?
The nature of our artificial intelligence services depends on many factors such as place, time, and level of the risks. The company offers many services in many fields like tracking and counting endangered animals in the wild and detecting the efficiency of solar panels.

How do you justify the statement of your company's slogan "Transferring traditional solutions to another level of efficiency"
After conducting meetings with the Office of Environmental Conservation, we found that the methods used in the reserves are not that effective and have so many drawbacks, so we decided to use solutions based on the 4IR that are faster, more accurate and easier to use.

Who could be I VIU customers?
Electricity and solar panels companies, wild reserves, Oil & Gas Company, and Royal Oman Police

Under 4IR, how I VIU activities fit in?
In our company, the 4IR plays an important role, since we are using the unmanned vehicles to accomplish daily tasks. In such cases, we must use artificial intelligence along with the big data set to train the vehicles and the program to do different applications.

What you can expect about your IVIU to align in the progressive speed of 4IR?
Our company is one of the modern companies that totally relies on 4IR technologies, so we must be aware of the modern changes that might influence our role as a UAV and AI provider in Oman. Moreover, we have education plan that aims to keep us among the 4IR.

Oman is blessed with rich assets of animal, plant, marine and microbial genetic resources. What do you think?
Of course, Oman is one of the countries that have variety of animals, plants and marine life, and the aim of our company is to ease the process of protecting, counting and identifying variety of creatures to follow our Sultan Qaboos vision in protecting and enriching Oman environment.

Our center deals with collection and conservation of all kinds of genetic resources in Oman like animals, plants, marine and microbes. How your company can play a role in our activities?
For sure. In Oman, there are more than 20 reserves. These reserves contain a lot of endangered animals. Tracking and counting these animals is time-consuming and costly process and there are no enough inspectors to do the job. So, these reserves have merits of maintaining the biodiversity and protecting endangered animals which can be used as an attraction for tourists to generate income to the state.

Can genetic resource-based businesses change attitudes for conservation of country's genetic resources in light of 4IR?
Yes. Our company will play a big role in maintaining biodiversity and protect endangered animals from extinction using unmanned vehicle with customized artificial algorithm and real time results amazing impression, which gives the power to the team members to think out of the box to get more solution in different fields to solve cost problems using unmanned vehicles. The creatures live in the different areas of Oman which have their unique features, and from our daily observation, Omanis always prefer the local goods over the other, and hence we have to save them for the future generation, so that they can know the past of their land.

What are your plans to upgrade I VIU's activities to suit to welfare of society in Oman?
Our company has a big plan to support and achieve Oman vision 2040 in the field of 4IR. to enter the logistic, criminal investigation, oil and gas fields. Also, we have a plan to provide job and training opportunities for Omanis.

Mawarid News

Oman Animal and Plant Genetic Resources Center (Mawarid) Launches its New Brand Identity

Tweaked to Align with Oman Vision 2040 and Mawarid Multiple Roles and Objectives

Old logo

Oman Animal & Plant Genetic Resources Center

New logo

موارد mawarid

Oman Animal and Plant Genetic Resources Center (Mawarid), of the Ministry of Higher Education, Research and Innovation has launched its new brand identity to reflect its multiple roles and objectives. The event took place at the 7th Annual Research Forum 2020. A brand identity really encompasses so much more than a simple logo. Building on its impressive slogan transforming genetic resources into value", Mawarid has established a solid ground for the launch of its programs and projects intended for the preservation, conservation and documentation of the diversified genetic resources. The vision behind Mawarid simple yet powerful new brand identity is to involve all details and touch-points from the vibrant colors of the Omani natural landscape to our country's successful engagement with the 4th Industrial Revolution (4IR) and the breakthroughs made in all aspects.

The center seeks to achieve the priority goals of Oman Vision 2040 including education, scientific research, national capabilities, natural resources and environmental sustainability. Hence the name (Mawarid) is birthed and coupled with the new the logo to represent our refreshed identity as well as our legacy for the coming generations. Furthermore, Mawarid works actively for better utilization of Oman natural resources by expanding its activities on what has been accomplished during the past years including the creation of a series of databases of Oman's diverse genetic resources, establishment of the genes bank, valued added and genetic innovations, opening job opportunities through initiatives like Manafaa and educating the community about the value and importance genetic resources and selflessly to deliver more accomplishments and headways consistent with the goals of Oman Vision 2040.

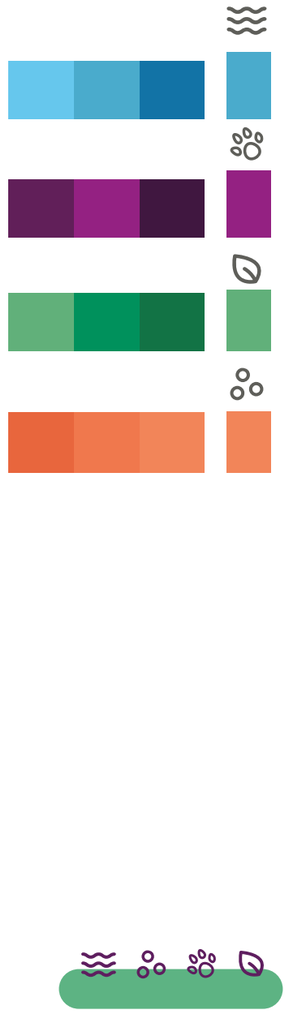
Mawarid new brand identity is artistically derived from its existing logo which consists of two curved overlapping lines inspired from the double helix shape of the DNA and the two English alphabets (YX) represent the genetic theme which is the operational activities of Mawarid. The two lines are overlapping to produce the shape of a wheat spike - wheat is one of the crops expected to ensure food security in Oman. The red solid oval shape in the lower part of the logo represents the seed for the plants or the ovum for the animals. The cramped symbolic chromosomes are used to relay the interconnection between bio-organisms in the creation of a balanced ecosystem while other part symbolizes the use technology in biodiversity.

The elements of the rebranded identity were crafted to feature Mawarid countless achievements by drawing a symbolic shape inspired from the leaves, stem and roots of plants as well as from birds, wildlife, coral reefs and marine life in order to lend robustness and clarity to the identity as it communicates our personality and projects our deliverables and expectations.

On the other hand, the visual identity (Mawarid) portrays set of values and goals of Mawarid and relays the same directly and vividly. The new logo is developed from the original logo yet with a comprehensive visual language to make it looks more innovative and creative. "Mawarid" is added in the centerline of the logo so that it stands out and catches peoples' attention. Yet it is still simple and fuels recognition and makes big ideas and meanings easily comprehensible.

The brand color palette is a crucial part of building a successful company identity. Colors elicit emotions and feeling plus they convey certain messages. Red, green, purple and grey make up the primary colors of Mawarid brand identity. Red color represents passion and energy while green color is associated with abundance and sustainability -values that Mawarid dearly cherishes and espouses. Purple and grey colors represent evolution, creativity and robustness and the present the identity in a vibe of professionalism that positions it for success. The secondary colors are the purple, green, blue and coral are derived from the biodiversity of Oman and will be used to represent the four kingdoms of species.

The design and development of the new brand identity exude creativity out of the very visual content. The end result of this work is the realization of brand identity around which the values, mission, objectives of Mawarid are perfectly aligned.



Mawarid
News

Good Laboratory Practice and ISO 17025:2017

17th to 19th of January 2021
delivered by: Nikolas Karnavos, Chemical Engineer MSc
Location: Online via Microsoft Teams

Purpose:
To gain an in-depth knowledge in the Good Laboratory Practice (GLP) in accordance with the international rules and standards as well as the modern laboratories GLP system. To distinguish the various GLP standards and regulations that set out the requirements for technical competence and proper management of analytical laboratories. Finally, to get the basic knowledge of the ISO 17025:2017 quality system and its requirements.

منافع
مارثون أفكار التنوع الأحيائي

Manafa'a program

28th February 2021

Mawarid honored the four winning teams of Manafa'a program in its fourth edition with prize of RO 2,500 on a private occasion due to Covid-19 pandemic.

We are now accepting articles on any topic related to genetic resources - ranging from business, fashion, innovation, environment, lifestyle, culture, heritage, food and farming. Any article submitted to us must be original and exclusive to OAPGRC's quarterly Newsletter.

Articles submitted shall have the following:
Minimum of 500 words
Photos accompanying text should be in high resolution
Please forward material to: zahra.alabri@oapgrc.gov.om

To see previous OAPGRC e-Newsletters, please click here:
https://oapgrc.gov.om/Pages/E-Newsletter.aspx

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