



The National Field
Research Centre for
Environmental Conservation
About innovative Environmental Research



Sultanate of Oman
Diwan of Royal Court

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Issue 56

Discovery of a New Species

of Freshwater Fish In Jabal Samhan Wadies





» Launch of the «Environmental Dictionary» Tag to Enhance a Culture of Environmental Conservation

The Office for Conservation of the Environment at the Diwan of the Royal Court, inaugurated marking the «Environmental Dictionary», which aims to publish a number of terms related to environmental reality and the promotion of environmental culture among the community. This launch comes within the framework of the efforts made by the Office to spread the culture of preserving the environment and involve the community to contribute to the rooting of this culture and making sure it is circulated throughout the community. The Office for Conservation of the Environment used to Publish on its page many guidelines that must be adhered to the preservation of biological diversity of rare creatures, in addition to documenting many observations related to rare animals found in the Omani environment such as Arabian Tahr, Arabian oryx, gazelle, Leopard and many birds. The Environmental Dictionary includes

many definitional terms and vocabulary such as: reserve, predators, camera traps, biodiversity, tracking collars, propagation, conservation, sustainability, and other terms and vocabulary. The Sultanate is characterized by its biodiversity and the multiplicity of environments that contain these organisms. The camera traps on the plains of the Ras Al-Shajar Nature Reserve monitored the Arabian gazelle while it was in a constant struggle to impose sovereignty and control and show signs of strength and courage through the competition of male gazelle, announcing the challenge through a series of behaviors such as blowing sounds and stirring dust with hooves and pods. The Office for Conservation of the Environment has recently celebrated the setting free of 129 antelopes (Arabian Oryx, Arabian Gazelle and Reem Gazelle) to return to their natural environment in the Wildlife and Wildlife Sanctuary in Al-Wusta Governorate

» 20 Species of Cetaceans Found in Omani Waters

The Environment Society of Oman stated that 20 species of cetaceans, which include «whales, dolphins, and porpoises» are found in Omani waters, where they have a high rate of reproduction. The Society pointed out that 89 species

of these porpoises have been registered around the world, living and settling in seas and oceans millions of years ago. The Society stressed that humpback whales, humpback dolphins and blue whales are the most endangered species of whales and dolphins.

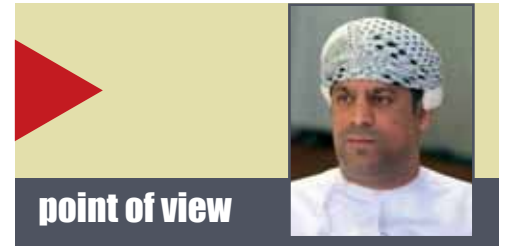


» Musandams «Environment» Resets Free a Booby Bird after Recovering

The Department of Environment and Climate Affairs At Musandam Governorate, represented by the Division of Nature Conservation is seeking to preserve wildlife and biodiversity, by preserving different strains of all species. After the experts of the Section of Nature Conservation confirmed that the Booby Bird has recovered and gained its ability to fly,

it was set free by wildlife monitors near the beach of Bussa in the Wilayat of Khasab. This effort comes as result of a notification received from a informing that he saw an infected bird due to its swallowing a large fishing hook at the sea in the Wilayat of Khasab. Then the citizen coordinated with the specialists of the Environmental and Climate Affairs Department in Musandam

Governorate and the bird was handed over. After taking care of the bird and providing the necessary health care for a period of six days including care, treatment and nutrition until the bird fully recovered and its ability to fly was confirmed, wildlife watchers released the bird to return to freedom. It was able to fly to live in its natural habitual and environment, which is the hot areas and warm seas.



point of view

Private Sector and Environment

Dr. Dawood Sulaiman Al Balushi
Editor-in-Chief

Environmental projects, activities and programs are considered one of the most important priorities for environmental action in any country in the world, as countries strive to achieve environmental sustainability through the diversity of environmental projects that protect the components and elements of natural life from deterioration and extinction. Such projects aim to achieve continuous development in a way that guarantees their survival and growth. This is in line with the compliance with the saying that “the environment is not only legislation and awareness, but is a common denominator between legislation and accompanying action.” The accompanying action means projects, activities and programs that guarantee the keeping of environment as fit and clean for future generations.

In our Arab countries, we find that the implementation of environmental projects and activities is always the responsibility of government agencies, where these authorities spend very large amounts of money to implement their environmental projects, while the opposite is the case in western countries, where the private sector adopts the financing of most of these projects out of the faith in profound social responsibility towards the environment and the service of society, believing that achieving sustainable society interests is related to preserving the environmental system and its natural elements. In addition, the projects that the companies create bear the names of these companies as a kind of encouragement for them to maintain the success of such project.

In the Sultanate of Oman, we find a sort of reluctance by the private sector to adopt the establishment of environmental projects, activities and programs for the benefit of society, if we exclude some very few institutions, which have contributed to the establishment of some environmental projects and initiatives. These companies are very few compared to the large number of large companies that have direct and indirect impacts on the Omani environment, though they take advantage of the natural resources of the country, without having any contribution to the development of the Omani environment.

We hope that in the future the Omani private sector will have an important and significant role to play in the implementation of environmental projects, programs, activities and initiatives for the benefit of society, and that such contribution will be an essential part of the social responsibility of these companies, with the enactment of a law obligating companies that have direct impacts on the environment to implement environmental projects and programs for the benefit of society.

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The Sultanate & Bird Migration



By: Nasr Al Rahbi

Many species of birds migrate, despite the fact that animal migration generally has a high risk of predation and mortality, especially those risks caused by human hunting, which is linked to the basic need to provide food. Bird migration often occurs in the northern half of the Earth, where birds are forced along paths defined by natural barriers such as the Mediterranean or the Caribbean.

Reasons for Bird Migration:

1. Environmental changes.
2. Search for food.
3. Climate change.

The Sultanate is located within the migratory line of the coastal birds, that migratory line which is called the Afro-Eurasian track. So the Sultanate is considered a stopping point for many of such birds, due to the Sultanate's diversity in geography and topography which is consisting of mountains of varying heights, desert lands, marshes, wetlands and coasts extending from the far north to the far south. This made the Sultanate embracing different types of birds of prey that spend the winter in the Sultanate.

Massive swarms of migratory birds pass through the Sultanate during the annual seasonal trips. Some birds migrate in the winter in search of warmth and food from the very cold areas, and some migrate in the summer in search of a suitable habitat for mating and nesting.

The migration lines represent three main passages that all pass through the Sultanate:

1. From Europe to the continent of Africa.
2. From Europe to Asia.
3. From West Asia to East Asia.

In the sixties of this century, a large number of wild ducks species was found in the North Al Batinah Governorate, most of which appear in the autumn days, when the number of migratory wild ducks to the Sultanate reached to (15) species. Migratory birds spend a long time in the Sultanate spanning an entire season. Among the types of birds those which are known as visiting birds, which come to the



atmospheres of the Sultanate in the winter, including Iraqi goose, decorated red, white-headed blackbird and other birds coming from India, Iran and the Arctic regions. As for the birds that use the Sultanate as a habitat for reproduction, they reach (115) species, most of which breed in the Sultanate regularly.

There is a type of migration known as internal migration, which is the movement of birds in the borders of the Sultanate. This migration is relatively weak in some seasons, and often occurs at short distances and within the same region; as most types of breeding birds have created semi-permanent environments for themselves.

The Sultanate's Efforts

The Sultanate celebrates the International Day of Migratory Birds in the second week of May every year. The occasion was celebrated for the first time in 2006 through two international conventions for the conservation of wildlife managed by the United Nations Environment Program (UNEP) namely the Convention for the Conservation of Migratory Species of Wild Animals (CMS) and the Convention for the Conservation of African-Eurasian-Migratory Water birds (AEWA).

In addition, the Sultanate is making many efforts to educate society about the threats that migratory birds are exposed to, such as habitat destruction, excessive exploitation of natural environment resources, as well as the presence of different types of pollution and climate change. In this regard, the Sultanate directs everyone to the need to preserve the migratory birds during their migration as an important part of the Sultanate's environmental balance in particular and to preserve the diversity of birds in the world in general.

By: Gary Lyon:

A team of researchers from the National Field Research Centre for Environmental Conservation (NFRCEC) at the Diwan of the Royal Court have discovered a new species of freshwater fish living in a set of pools, located in Wadi Andhur, in Jabal Samhan Nature Reserve, in the Dhofar Governorate. The fish, which gleans algae and various invertebrates, from the rocks and within the water column, has been named *Garrasindhi*.

Discovery of a New Species of Freshwater



The details of this discovery are attributed to an expedition in late 2014, by a team from the center led by Dr. Alan Rowe, with a small party of researchers including, Gary Lyon, Dr. Marina Tsaliki, Dr. Erika Cuellar, the researcher Muamar Al-Shanfari and the researcher Khalid Al-Hikmani. The team entered the Nejd (stone desert) via Thumrait, with the aim of conducting a short study of the area and hoping to record as much information as possible, about the wildlife found in the Jabal Samhan Nature Reserve.

The team, of which I was a part, had already explored a large part of the Jabal Samhan Nature Reserve and had made an intensive, year-long study of the biodiversity of several wadis (dry river valleys) in the region. The goal was to make a quick survey of what might be found in the area lying above the escarpment of the reserve. Our research had already yielded much information about the bird life, mammals, reptiles, amphibians, plants, aquatic life and invertebrates, in the region, including a potential new plant species, and a new record of distribution for the brush-tailed Jerd.

The fish was discovered in a set of pools about 45 km away from any road which are reached along dusty tracks with sections of deep sand, steep descents and twisting passages with additional tracts of stone gravel. Throughout the wadi and surrounding the pools, we were able to record the tracks of striped hyena, Indian crested porcupine, red fox and honey badger and we found many species of rodents, birds and other animals.

When we first approached the pools, we noticed immediately that there were some fish swimming in

the shallows. A number of them were fairly large, appearing a dark, olive green hue as they darted around in the clear water. They were moving about and feeding on the surface of the rocks with their under-slung, sucker-like mouths. The largest specimens measured roughly 80 – 85 mm but the average was about 45 mm. Smaller specimens appeared green with speckled golden flecks in the light and had a faint yellow or golden dorsal stripe running along their back. A lone black-necked grebe, a local aquatic bird,

was observed pursuing the fish under water.

Fish of Various Sizes

“Having read about the freshwater fish of Oman, and having studied the fish fauna in several wadis in Dhofar, we were familiar with the known and expected fish fauna in the region. We instantly recognised the fishes in the pools as specimens belonging to the genus *Garra* a member of the Carp Family, Cyprinidae. This is a curious genus which is represented by many species occurring throughout parts

Fish In Jabal Samhan Wadies



- Their sizes vary, with the larger adults reaching between 80 to 85 mm and smaller juvenile to sub-adult fish measuring about 45 mm
- The new fish discovery in Jebel Samhan Natural Reserve will strengthen the argument for protection of the ecological and biological systems within the reserve

of central Asia, including Iran, Pakistan, Turkey and India, and also in parts of Africa, particularly in Ethiopia. Our team knew that there were only nine known species in Oman and that only two of those species were located in the Dhofar Region.

New Specimen

We had already managed to collect a few specimens of one of the species, *Garra smarti*, which had been discovered and described a few years before, in a wadi situated roughly 70 km away, as the crow flies. In addition, the only other species known in Dhofar, was *Garra dunsirei*, a troglodyte species that was found in Tawi Atair sinkhole, in a cave situated at the base of the 211 metre deep sinkhole. It is thought that these fishes were once widespread during wetter times with abundant rainfall and more permanent water bodies.

As the region became drier in the last 10 – 15 000 years, so the water bodies have dwindled and the populations of fishes become more isolated. This created disjunct or isolated populations which have since evolved to become new species in their own isolated environments.

Before *Garra smarti* was collected and subsequently described in 2009, *Garra dunsirei* was considered to be the only truly indigenous freshwater fish species within a 600 km radius. Yet here was a member of the genus swimming around in a few isolated pools, in an endorheic wadi

(a wadi that flows into the desert and not the sea) in the middle of the gravel desert of the Nejd in central Dhofar. We suspected immediately that this could indeed be a new species. We set two baited traps to capture some live fish specimens and continued with our data collection and survey of the remaining terrestrial fauna and the flora of the area. A few hours later we returned to the pools to count, measure and examine the captured fish specimens and measured a few hundred fishes before releasing them back into the pools.

A Rare and Vulnerable Species

The value of such a discovery cannot be underestimated. A new species has been described for science. The fish is now formally known and the population is now recorded to be rare and vulnerable simply because of its isolated and precarious existence in the desert. This knowledge allows conservationists and government entities to take steps to protect *Garra sindhi* by protecting its local habitat. This protection reinforces the argument for the protection of the Jabal Samhan Nature Reserve and protection of the fish's habitat also

A Distinguished Group

We anesthetized 10 representative specimens for later examination and comparison with specimens from collections of known species kept in the Oman Natural History Museum. More specimens could have been collected but we erred on the side of caution to protect the population, which is relatively small and which is not known to occur anywhere else. After examination in the museum, it became evident that this was a morphologically distinct population from other known fish species and so we determined to collect more specimens for genetic analysis and to increase our sample size to be more statistically significant. Mr. Khalid Al-Hikmani and I were later able to return to the pools to collect the remaining specimens and we collected a final total of 30 individuals, which were photographed and preserved. These specimens were sent to Germany where my co-authors of the paper, Dr. Jörg Freyhof and Dr. Matthias Geiger conducted the genetic analysis and made some more morphological comparisons to fish specimens kept in European museums. We concluded that the fish species from Wadi Andhuris genetically closely related to its two neighbors and that it is nonetheless a genetically distinct population and therefore a new species. Its closest affinity was determined to be to the population of *Garra smarti*. Armed with this knowledge we completed the scientific paper to describe the fish and it was published in the scientific journal "Zootaxa" a full year after we had originally discovered the fish. The fish was named *Garra sindhi*.

means that the ecosystem is protected for other species of wildlife that make use of the pools in Wadi Andhur'.

Vegetation is a critical component of the ecosystem surrounding the rocky pools where *Garra sindhi* is to be found, so, any protection that might be afforded to the area, will, in turn, protect the area against poaching, overgrazing, wood harvesting and charcoal production. This will add ecological value to the area thereby increasing the resilience of the wildlife community. Hopefully these efforts will help to protect Oman's precious natural heritage into perpetuity.

» «The Difference is Two Seconds» .. «Environment Campaign to Reduce Dumping of Waste outside the Containers

Oman Environmental Services Holding Company (Bee'ah) has launched an awareness campaign entitled «The Difference is Two Seconds», after managing to completing transferring of 100% of municipal waste. The campaign aims to reduce the wrong behavior by some individuals when disposing of waste by throwing it outside the designated waste containers, the matter that distorts the general view, and constitutes a burden a burden to the cleaning workers who work under the hot sun despite the simplicity of the required action which is to place the waste inside the bag, and tightly close the bag and then place the bag in the designated container. The campaign «The Difference is Two Seconds»

also seeks to raise awareness about the dangers of throwing waste outside the designated containers, and about the fact that the time it takes only 45 seconds to carry out a modern waste transfer per container approximately and that the needed time for the same process will be doubled due to throwing waste outside the containers. These facts are what is indicated by the campaign title. Bee'ah confirms the existence of a communication service with Bee'ah Call Center through the number: 1881, for the transportation of large waste; Such as furniture, dead animals, green waste and other large waste. Bee'ah directs the public not to throw the waste near the designated containers, for not distorting the general view of the city.



UAE

Signing of a Memorandum of Understanding to Protect and Breed Houbara Birds

As part of its strategy to conserve biological diversity, ensure its sustainability, and protect endangered species, the Ministry of Climate Change and Environment signed a memorandum of understanding with the International Fund for the Conservation of Houbara birds, aiming at enhancing cooperation to conserve this living species, which is of an environmental importance for the UAE.



Qatar

Removal of mesquite trees on the North Road

The Ministry of Municipal and Environmental Affairs, represented by the Department of Protection and Wildlife, announced the start of a campaign to remove harmful mesquite trees along and within the North Road, with the support of private sector companies in the country. It is worth noting that since the issuance of a ministerial decision in 2017, more than 4000 mesquite trees have been removed from various regions of the country and their cultivation and distribution inside the country was banned.

Kuwait

Follow-up the Phenomena of Fish Deaths

In terms of cooperation and coordination with the Crisis Management Program to support decision-makers at Kuwait Institute for Scientific Research and the Regional Organization for the Protection of the Marine Environment, through monitoring programs for regions where red tide phenomena recur and accompanying the seasonal fish mortality phenomenon, an increase in the rates of chlorophyll was monitored through analysis and study Satellite images in JoneAlkuwait. The Public Authority for the Environment also collected and analyzed samples

of water quality and phytoplankton from routine monitoring sites (25 and 29 June 2020), where analysis showed significant increases above the normal levels in numbers of Scripsiella spinifera, where the numbers at the Sulaibikhat site reached 20 million cells / liter , and 33 million cells / liter at the site of Shuwaikh, and the type of Scripsiella Trochoidea reached 8 million cells / liter near the Jaber Bridge. These great heights in numbers may produce fish death phenomena extending from the coastal areas of Shuwaikh and Sulaibikhat until Doha.



Bahrain

Signs a Memorandum of Understanding for Environmental Protection and Climate Affairs

His Highness Sheikh Abdullah bin Hamad Al Khalifa, the Personal Representative of His Majesty the King, Chairman of the Supreme Council for the Environment, signed a

memorandum of understanding on environmental protection, climate affairs and nature conservation, with Dr. Yasmin Fouad, Minister of Environment of Arab Republic of Egypt.

Saudi Arabia

Camel Numbering Reduces Traffic Accidents Caused by Loose Camels

The Ministry of Environment, Water and Agriculture urged camels owners to initiate numbering and documentation of camels, by taking advantage of the camel numbering services provided by the ministry without any financial fees in the current period. This comes as an implementation of the Cabinet's decision to obligate the camel owners to develop a special electronic chip for each body of camels. The Ministry of Environment, Water and Agriculture confirmed that at the end of the month of Dhu al-Hijjah, the free numbering period will end, and mandatory

numbering begins according to fees determined by the Ministry, starting on the first of the month of Muharram 1442 AH. Since the launch of the «Electronically Numbering of Camels» project, the Ministry has documented more than 860,000 camels in its electronic database, as this numbering helps build a comprehensive information on the numbers of camels in the Kingdom, their types, species, and geographical distribution, the matter that enables the ministry to put in place plans for improving animal production and anticipate epidemic diseases so as to prepare plans for treatment.



» Mysterious Mass Death of Hundreds of Elephants in Botswana

Disturbing reports about mass deaths of elephants have emerged out of Botswana over the past period, as more than 350 elephant bodies have been spotted since last May. Some elephants found dead with their faces facing down, indicating a sudden death. Most of the elephant dead bodies are located around water sources in the northern parts of the Okavango Delta, a protected area for elephants, along with a study site called «NG11». No similar deaths recorded in neighboring Namibia. Botswana has the largest number of elephants in the world, of the type «Luxodonta Africana» with more than 135,000 elephants. But the numbers of these majestic animals are declining all over the world. Hunters are known to use cyanide to poison elephants in Zimbabwe, but this conclusion was deemed improbable because the elephants' bodies remained with their full and intact tusks and there are no corpses of animals such as hyenas, lions, and vultures that would have died after eating the elephants' corpses.



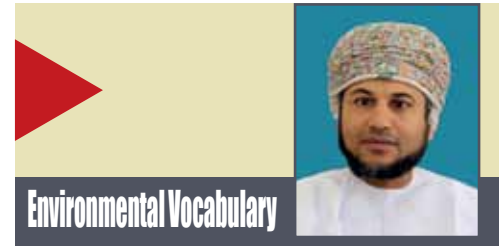
» Small Plastic Particles Accumulate in the Tissues of Plants



A recent study found that plants can absorb small pieces of plastic through their roots. The matter that impedes their growth and reduces their nutritional value. The study, conducted by researchers from the United States and China and published by «Nature Nano Technology» on June 22, is the first of its kind to provide direct evidence that nanoparticles of plastic can accumulate in the tissues of wild plants. What is worrying for researchers is that the risks - from the plants absorbing plastic from the soil through their roots - extend beyond their effects to the family of plants to include the rest of the organisms, particularly human.

» Scientific Research Reveals a Rapid Change in the Singing of the Canadian Sparrow Bird

In the 1950s, bird lovers in Canada were easily acquainted with the white-throated Sparrow bird thanks to its distinctive tone of its three concluding notes, but this behavior has changed in recent decades, prompting some scientists to analyze the reason for this rapid change. Canadians have been accustomed for years to mimicking the sound of this bird by composing syllables which tones resemble the composition of the triple melody of the Sparrowbird. However, biologists noted at the end of the last century that these birds began to show an innovative sense in the Canadian West by changing the tone of their voice to become two notes instead of three. In the past two decades, this new tone of the white-throated Sparrowbirds has spread throughout Canada from west to east, passing through the provinces of Alberta and Ontario to Quebec last year, thus covering an area of more than three thousand kilometers of Canadian territory.



Environmental Vocabulary

The Mysterious

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Although it is a small, it remains mysterious in its kingdom. Lots of researches have not been able to probe its depths or understand its behavior accurately. It has a complex and unique nervous system. Its head is highly developed and its brain ratio to the body is the largest of all molluscs, so is considered one of the most intelligent invertebrates. Living in the sea, the talking about it needs ink to the volume of sea. Simple words cannot surround the secrets of this gentle, light jelly animal.

With its thin fin that projects from its small body (525-cm tall, weighing up to 10kg) like wings can swim in a great agility and helps it control its directions. This is also assisted by its slim body composition and its ability to dive or float through its small porous shell bone called the sea tongue. This inner shell that protects its naked body fills its pores with gas and controls its proportion according to the degree of floating or diving. It is considered one of the most skilled swimmers among the molluscs. Its big head is surrounded by ten arms, including two long arms that reach the back of its body, which uses them to move and to catch the prey on which it throws some saliva to paralyze it before devouring. Usually Its prey is lobster and small fish, and in contrast it is a delicious food for sharks and big fish. Undoubtedly it is one of the best meals for human because of its innumerable nutritional and medical benefits.

Its eyes pupil is shaped like W in the light and turn into a letter O in the dark. It can see in front and back at the same time because there are two spots in the retina, its never the less has color blindness. This wonder animal is one of the living organisms that have an exceptional ability to camouflage, as its skin has cells of color spots through which it can change its color very quickly according to its surroundings, and may be invisible at the bottom of the sea so some have called it sea chameleon. In case of extreme danger, black ink is released to deceive predators. Surprisingly, its circulatory system consists of three gill hearts that pump blue-colored blood that contain hemocyanin instead of hemoglobin. The males have their own genital rituals and compete with each other to accepting the female, so the male releases flashes of light to flirt the female, if the female is convinced by flirtation approaching its head to the head of male and hugging with their arms, then the male puts the sperm bag into the cavity under the female mouth and then fertilizes her eggs before releasing them into the water. The parents then pay their life for this new birth. Squid is considered the most breeding animal in the water and lives up to three years.

There are many species of squid in most seas of the world. Oman has abundant stock of it, and due to the high demand, the competent authorities have set six months to fish it starting from the beginning of August each year. Many of this animal's secrets are still lurking in the hidden world, such as the sea, whose wonders do not end, and its secrets never be explored.

Home gardening



I will plant a tree and I will eat its fruits



Our home is beautiful, and it becomes better when we planting plants



Let us take care of this tree because it gives us oxygen and fruits

