

TAYF

The Soqotra Newsletter



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Dear *Tayf* reader,

As you know, FoS (Friends of Soqotra) is a non-governmental and non-profit charity registered in the UK, consisting entirely of volunteers. It was established to raise awareness of the unique natural environment and culture of the Soqotra Archipelago. FoS supports and promotes an environmentally friendly and sustainable development of its inhabitants' lives through various activities, including small-scale projects. Members of FoS belong to different countries in Europe, Middle East, Africa, Australia and the United States – membership for Soqotrans is free. The annual budget of FoS is small, with annual expenditure about \$1000 US dollars per year, and financial reports are publicly available online. Local Soqotri NGOs can contact us to request support for small initiatives (not more than a few hundred dollars), which are discussed yearly at the annual meetings.

The Association was formed in 2000 with the aim of bringing together scientists interested in Soqotra and people with a more general interest in the Archipelago. FoS members meet every year in a different place around the world where research and conservation issues of the islands are openly shared with anyone who wishes to attend.

In October 2018, the FoS annual meeting and conference was held for the first time in the Arab Region,

hosted by ARC-WH in the Kingdom of Bahrain, the largest scientific meeting ever organised about the Soqotra Archipelago in the region. Specialists and scientists gathered from all over the world, interacting with local champions in biodiversity and culture conservation from the Archipelago and Yemen. Everyone interested in Soqotra and its natural and cultural heritage is welcome to attend such meetings and contribute with ideas and suggestions to join the discussion forums. In 2019, the meeting was held in Palermo, Sicily and the venue for 2020 will be in Brno, Czech Republic.

Many activities contributing to the conservation of biodiversity and culture took place on Soqotra in 2018. The *Tayf* newsletter can only cover so much within a limited space, but our enthusiastic editors have compiled some of the information out there for you to read on new scientific articles and activities. Several projects on the ground have been carried out by hardworking Soqotri conservationists in coordination with the local government, and these local Soqotri men and women have proudly presented their work in person at the AGM in Bahrain, of which the abstract book can be found on our website.

FoS keeps promoting awareness on the uniqueness of Soqotra – however, there are many challenges that the Archipelago's nature and culture face, such as the overarching

impacts of climate change, unsustainable resource use and the gradual loss of the special Soqotri language. All over the planet, biodiversity and unique cultures face similar challenges. We therefore hope that the continued exchange of knowledge through communication, such as during the yearly FoS meetings, can be of help. We thank all of you for supporting FoS and Soqotra, and you as the reader of this *Tayf*, for your interest.

This *Tayf* is also available in Arabic on the website. Previous issues of *Tayf* and the information FoS leaflets on different plant and animal groups in Arabic and English are freely available for everyone online at the website www.friendsofsoqotra.org. Details on the FoS constitution are found at <https://www.friendsofsoqotra.org/About/pdfs/constitution.pdf>

FoS Chairperson
Dr Kay Van Damme

*FoS members were greatly saddened to learn of the recent death of **Dr Wolfgang Schneider**, long time FoS member and researcher on Soqotra. All our sympathies to his family and loved ones. A full obituary will appear in the 2020 **Tayf**.*

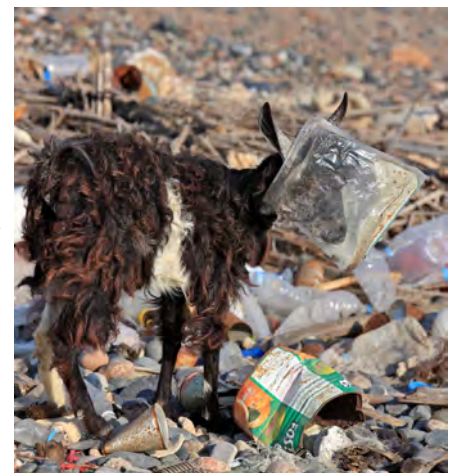
NOT For Sale
but
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Front cover photo:
Ismael Salem (ARC-WH)/Soqotra Heritage Project.
Back cover photo:
Vladimir Melnik

Soqotra or Socotra
It is up to the author which spelling they use in their article.



The Raha and its Sister Gecko of Socotra

Text by Karin Tamar and photos by Raquel Vasconcelos

The Socotra Archipelago is home to several unique species of geckos that are found nowhere else in the world. Two such species are the *Haemodracon* geckos from Socotra Island. These two nocturnal geckos are easily differentiated based on their size – *Haemodracon riebeckii* is almost three times larger than *Haemodracon trachyrhinus*. This obvious size difference is even more interesting since both species are seemingly found in the same area. So what triggered or influenced this size difference if they both seem to live together? Why is one larger than the other?

To investigate this size discrepancy, data on the geckos were collected over several years, including their DNA, measurements of body and limbs, and observations on their habitats on Socotra Island.

We found that *Haemodracon* geckos are very ancient reptiles that originated in the Arabian Peninsula

around 42–48 million years ago, even before the archipelago existed, and that they evolved on Socotra Island into the two currently recognized species about 15–16 million years ago. We also learned that even though the species obviously differ in their size, they unexpectedly have the same shape and limb proportions – so size seems to be the major body difference.

The larger gecko prefers to live on vertical surfaces and the smaller on horizontal areas.

Although the two species apparently occur in the same area, we discovered that they actually live in different habitats – the large *Haemodracon riebeckii* prefers to live

on vertical surfaces such as tree trunks and boulders, while the smaller *Haemodracon trachyrhinus* prefers horizontal areas such as on the ground or on shrub branches.

We speculate that the size difference between the species probably has to do with their different preferred

habitats and that the interactions between them and with their environment, such as competition for food and escape from predators, led to the size discrepancy.

Reference: Tamar, K., Simó-Riudalbas, M., Garcia-Porta, J., Santos, X., Llorente, G., Vasconcelos, R. & Carranza, S. (2019). An integrative study of island diversification: Insights from the endemic *Haemodracon* geckos of the Socotra Archipelago. *Molecular phylogenetics and evolution*, 133: 166-175. doi.org/10.1016/j.ympev.2019.01.009

Figure 1. The two *Haemodracon* species, unique to the Socotra Archipelago. **A)** The larger *H. riebeckii* prefers to live on vertical surfaces such as tree trunks. **B)** The smaller *H. trachyrhinus* prefers to live on horizontal surfaces such as branches.



The Socotra Buzzard

Richard Porter, BirdLife International

With a population of about 250 pairs, the Socotra Buzzard *Buteo socotraensis* is the rarest endemic bird species in the archipelago. By definition it is very rare and listed by IUCN and BirdLife International as globally threatened, in the category Vulnerable. Those responsible for safeguarding Socotra's natural heritage must ensure it doesn't move to the higher category of Endangered.



Adult with prey

The buzzard is one of five birds of prey that breed on Socotra: the Peregrine Falcon *Falco peregrinus*, Common Kestrel *Falco tinnunculus*, the fish-eating Osprey *Pandion haliaetus* and the Egyptian Vulture *Neophron percnopterus*. Socotra has the highest concentration of this globally Endangered vulture in the world.



Typical nesting cliff

The Socotra Buzzard is about the body size of a healthy chicken, but there the similarity ends. When it takes to the air and soars and circles in the warm thermals of a mountain slope it is an impressive bird with broad wings which span well over a metre from tip to tip. From the few studies made its diet is almost exclusively reptiles and invertebrates and its method of catching prey seems largely to rely

on 'perching, waiting and pouncing', rather than a soaring and searching technique, so frequent in many other buzzard species.

Socotra Buzzards can be seen displaying, including aerial tumbling and

talon grappling, from October to February. Nesting activity is from October through to April with eggs and/or young observed in all these months. The nest is made of sticks and usually built on an inaccessible cliff-ledge, sometimes with a bush or vegetation for protection. Although rare it has a fairly wide distribution but only on Socotra's main island. It prefers to be in mountain or hilly areas with a good woodland covering.



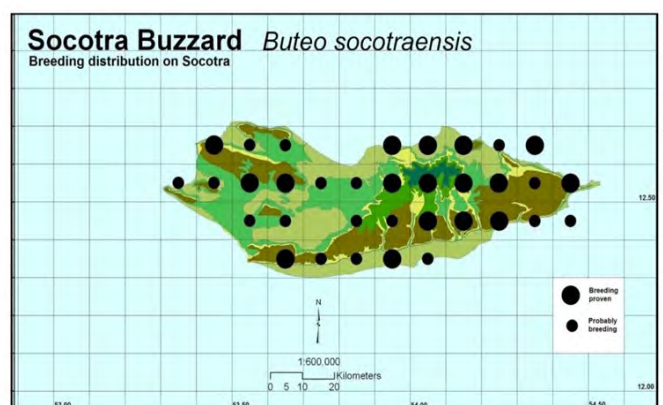
Once young birds were taken from the nest in the misguided belief they could be sold for falconry. However, this practice appeared to stop when it was realised they were not good hunting birds for falconers and no one wanted to buy them. Now it is illegal to take or kill buzzards on Socotra and, along with other animals and plants, you are not allowed to export them.

Finally, here is a little known fact. Although this bird has been known since the first visits by wildlife explorers, it was only officially named in 2010 when it became the 'Newest bird of prey in the World' which earned it a place in the *Guinness Book of Records!*



Juvenile soaring

For more info, see: Porter, R.F. & Kirwan, G.M., 2010. *Studies of Socotran birds VI. The taxonomic status of the Socotra Buzzard. Bulletin of the British Ornithologists' Club 130: 116-131 (available for free online)*



Raising awareness of Socotra's Egyptian Vultures and unique wildlife

Report prepared by Ali Yahya A. Mahroos on behalf of the Socotra UNEP-GEF team

Socotra is a wonderful and unique island and we have been lucky to have a conservation programme that has been supported by United Nation Environment and the Global Environment Facility (UNE-GEF), the Environment Protection Authority and the Socotra Wildlife Association.

For the last two Septembers we have been able to celebrate International Vulture Awareness Day with a generous grant of \$2,000 from the Ornithological Society of the Middle East (OSME).

Socotra has a population of nearly 2,000 Egyptian Vultures – probably the largest concentration in the world of this Endangered species. We wanted to tell the people of Socotra how lucky they are to have



people. The activity received a wide media coverage at both local and national levels.

During these training days team members delivered talks on the unique Biodiversity of our protected areas, our endemic birds and our special Egyptian Vultures and eco-tourism concepts. We also took field visits to Sirhen and Qaria lagoons to watch birds.

Other events in September included workshops on plastic recycling (plastic waste and how to recycle) and drawing birds. These were attended by 20 students from Hadibu and Qalansiyah towns.

In the drawing competition the students were given a week to draw and recycle the plastic waste into artwork and we then judged the best. Several awards and certificates were given to school children who did the best artwork.

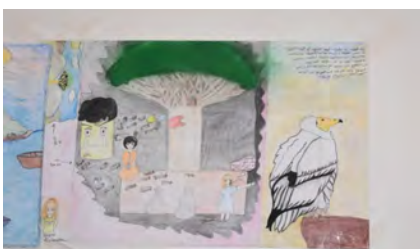
There was much concern and activity over plastic waste and our awareness events were attended by a number of officials, the local community, the women's sector and young people. We had lectures and

videos about the negative impact of plastics and carried out plastic waste clearance in a number of areas.

We were pleased that our events were in collaboration with the Environment Protection Authority, Education Department, Socotra Cleaning Fund, the

Socotra Wildlife Association, the Coastal Women Association, Youth and Children Government - Socotra members as well as other groups in the local community and several officials, including the acting governor.

Photos: top, bird watching at Sirhen Lagoon, left award winning artwork, above, clearing waste.



this bird breeding on our remote island.

This autumn, as well as the Vulture Day, we held three training days for eco-tour guides. These were opened by the deputy governor of Socotra and many local authority leaders and officials attended. Those joining us included the Tourism Police, local travel and tour agencies, hotels, the Culture Office and many young

Rock Art on Soqatra 2: SHP067

Julian Jansen van Rensburg, Freie University Berlin, Germany



SHP067, known locally as *šīšēŕe* (pl. *šašāŕhinītin*), which means a stone pavement, flat rock surface, gently sloping stone pavement or bedrock (translation kindly supplied by Miranda Morris) is the second site in this rock art series. Spanning an area of over 176m² and featuring an extensive corpus of 187 rock art motifs, SHP067 is the second largest of all now known petroglyph sites on Soqatra.

This site was first mentioned during a survey undertaken by a joint British Royal Air Force and Army expedition that visited Soqatra between December 1964 and February 1965 (Boxhall, 1966: 200). However, other than referring to the fact they found rock art, there was no description of the site or motifs. This situation was partly remedied during a joint British military and civilian scientific

The second largest of all now known petroglyph sites on Soqatra.

expedition, between 17 March and 1 June 1967, when the archaeologist Brian Doe visited the site. According to his account, there were a “number of pecked designs”, several of which were cross-shaped, and others that were more “fanciful and flowerlike” in design (Doe, 1992: 82). In addition, Doe also mentioned that there was at least

one motif that resembled a foot and others that resembled the flower of an aloe (Doe, 1992: 82). Despite several subsequent archaeological expeditions to Soqatra, Doe’s description and sketches of ten motifs were the sole record of this

site.

This situation changed in 2017 when team members of the British Council Cultural Protection Fund project known as the Soqatra Heritage Project in collaboration with the General Organization of Antiquities and Museums (GOAM), Yemen re-located and fully documented the site.

Above: overall site. Below: Cross.





The scientific dating of rock art sites such as this is difficult, complicated by the fact that this site was likely to have been used over a long period of time. However, it is reasonable to assume that this site was likely to have been already in existence from at least the fourth century BC, although its is likely to have been in use from

attention of the Governor and local authorities. With their backing the site has recently been declared a protected cultural heritage site, a first for Soqatra. Well done to the efforts of all involved!!

Summarized from: Jansen van Rensburg, Julian, Ahmed Saeed Ahmed Al-Orqbi, and Esmail, Mohammed Ahmed Salem. 2018. Documenting a threatened rock art site on Soqatra, Yemen. Arabian Archaeology and Epigraphy. 29: 198–203.

Documentation of the site was done by combining conventional 2D digital photography with low-level kite aerial photography (KAP). These techniques allowed the team to systematically identify and map the wide range of motifs found at the site, the results of which were recently published (Jansen van Rensburg et al, 2018). The motifs recorded consisted of a wide variety of shapes and images that relate to Soqatra’s rich and interesting past. Amongst these were cruciform shapes, feet, plant motifs, a stylised ship believed to relate to a Portuguese caravel, and importantly a script similar to those found at Eriosh. This script now identified as Script 1, is known to be related to the family of South Semitic scripts, which is also found in Dhofar, Oman. Unfortunately, what exactly the authors of this script carved into the rock at SHP067 and Eriosh remains an enigma as, to date, the script remains undeciphered.

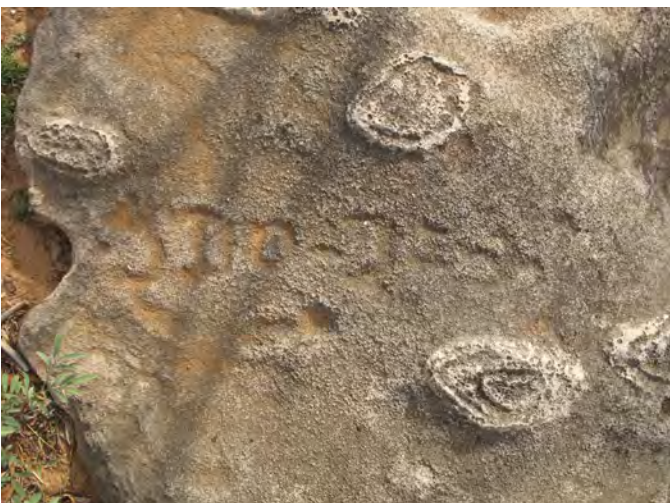
much earlier.

Much like many cultural heritage sites on Soqatra, SHP067 was under



severe threat from development works. However, thanks to the combined efforts of the Soqatra Heritage Project, GOAM and local landholders the dangers facing this important site was brought to the

Above left: foot, above: ship, below left: script, below right: plants



Five Simple Tips to Take Care of Surface Waters on Soqotra

Kay Van Damme Senckenberg Research Institute and Natural History Museum, Germany

1. Minimize Chemicals.

Using strong chemicals, especially in the water and around it, should be avoided where possible. Chemicals often stay in the aquatic environment for a long time, and can cause health problems for the animals that live in it, and also to humans and livestock. These chemicals include pesticides, oil, petrol and strong detergents. Even bio-degradable soaps and light detergents contain chemical pollutants, and fertilizers cause an increase in growth of algae in the waters. Where possible, minimize the use of strong chemicals in the environment and try to keep them away from the waters.

2. Minimize and Remove Waste.

Dumping rubbish in the water causes chemicals (see above), metal and plastic to get spread into the aquatic environment. If you see rubbish in the wadi, pools, lagoons, or in a *leem* (Soqotri) or *karif*, you can remove it and transport it to a designated area for rubbish. Minimize the dumping of batteries, car parts, anything that can rust or cause seepage of oils and other chemicals, bottles, and the many plastic bags, in waterways. Everything that gets dumped in the water high up the stream ends up lower down, affecting the people and livestock that use the water. Also minimize and remove organic Waste: Often, dead animals, or parts of dead animals end up in the waterways and pools. Even though this may provide a feast for some of

the endemic freshwater crabs, there is a very high risk of disease to humans and livestock spreading through water by leaving these animal remains. The remains of animals that have died or been eaten should be disposed of away from

You can help take care of water quality. How? Five simple tips show how to help keep mountain streams, wadis, *leems*, *khors* and temporary pools clean and healthy for life within and surrounding them.

water, or be burned, to avoid disease. To minimize the spread of diseases in water and the growth of algae, also avoid human organic waste. Community-based cleaning campaigns for waterways, *leems* and lagoons can be very

effective.

3. Protect the Vegetation around Water.

Vegetation around water is important. If the vegetation is gone and the soil is not held together by plant roots, this rich soil will wash away into the streams and underground, causing soil erosion. In the streams, it will add to the

nutrients, which become too much, leading to a larger growth of green algae. This is bad, because when the algae die, they consume all the oxygen and the water becomes foul. Changes on the land affect the waters.

4. Keep Waterways and Lagoons Connected to the Sea.

Waterways are like bloodstreams: if they are obstructed, they will die. Keep lagoons and wadis connected to the sea for their health. If a road passes a waterway, it should provide a connection (bridge).

5. Shout out for Clean Water!

Tell everyone what you learn about keeping water clean and helping the biodiversity within. The beautiful Socotran Bluet will thank you! Protect the dragonflies and the crabs, and you help control the mosquitoes!

Contact EPA Socotra (Hadiboh or Qalansiyah) and the National Water Resource Agency (NWRA) for expertise, support or concerns.



First World Conference on Dragon Trees

Hana Habrová, Petr Maděra

The first conference focused exclusively on Dragon trees, a few species among the more than 60–100 species of the *Dracaena* genus that reach tree size, took place in Brno between 5th and 8th September 2019.

More than 34 participants from 11 countries met with the main objective to present the latest results of their research. Contributions about taxonomy, evolution, distribution, ecology, anatomy, morphology, ethnobotany, eco-physiology, and species-specific relationships of *Dracaena draco* ssp. *draco*, *D. draco* ssp. *caboverdeana*,

D. cinnabari, *D. serrulata*, *D. ombet* s.l. and *D. steudneri* were presented. Most of the presentations were focused on *Dracaena cinnabari*, the endemic species from Socotra Island. Thanks to Friends of Soqotra members, it seems the most investigated species among arborescent *Dracaena* species. At the end of the conference, the informal Dragon Trees Consortium was established with the aim to determine the main gaps for future investigation and as the basis for conservation management of these tertiary relict species. It will also serve as a mechanism for possible future cooperation.



Students from Socotra studying higher school in Mendel University in Brno, Czech Republic

Mazen Aldarhe

MSc Student, Mendel University in Brno

In the year of 2018-2019, four students from Socotra Island are resuming their Master Degree in Mendel University in Brno, Czech Republic. The students are studying different programs on Environment and Forestry Management, Business and Economics.

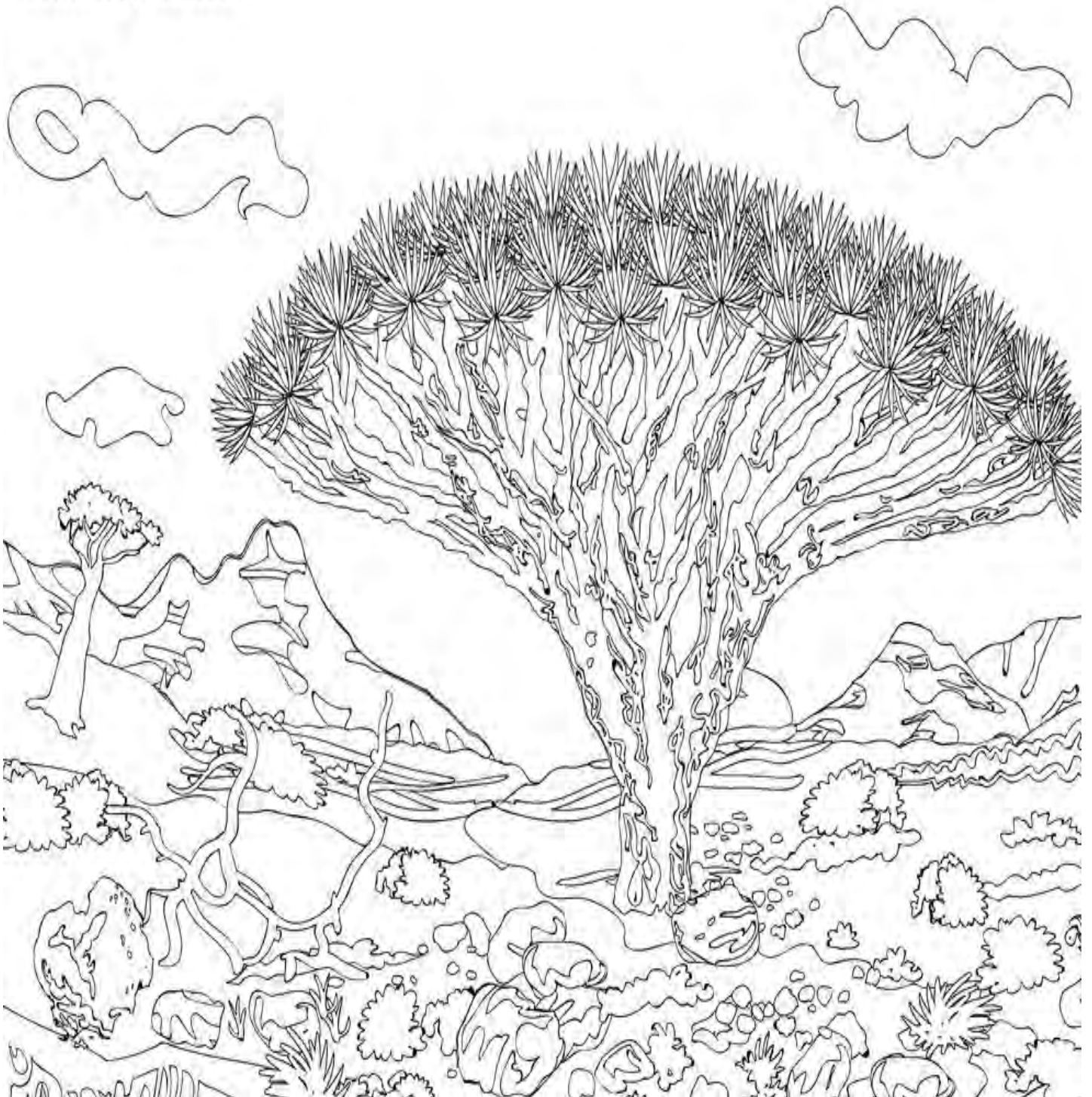
As part of the Czech Republic development intervention on Socotra, Mendel University in Brno in collaboration with the UN Environment-GEF Project has offered MSc scholarships for students from Socotra. These scholarships aim to build capacities of Socotri students to be able to sustainably manage their unique archipelago that is considered as one of the top biodiversity spots on our planet.

We would like to express our thanks and appreciations for the development and environmental efforts of UN Environment-GEF Project and the Czech Development Agency and Mendel University in Socotra Archipelago, Yemen. We would like to express many thanks and appreciations for the efforts of Prof. Petr Madera and Assist. Prof. Hana Habrova. Thanks to all whose supported and cooperated with us.

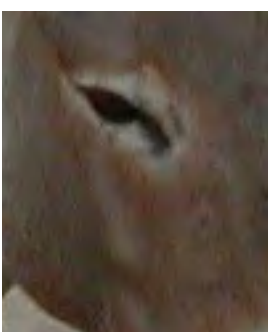
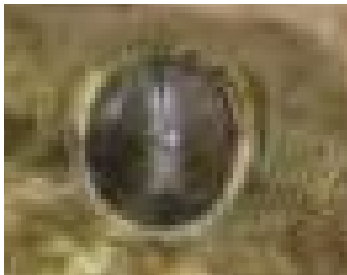
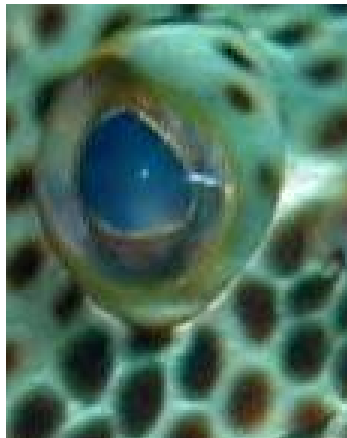
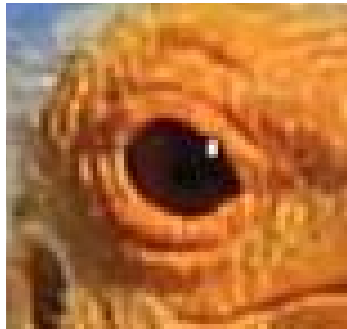
CHILDREN'S SECTION

Colour this picture!

Artwork by AnaitSmi



This is my eye—Who am I?



The pictures to the left and below show eyes of many different types of animals you might find on Soqatra—or in the seas around the island. Can you identify the type of animal from the eyes?

Some animals you might find are:

Grasshopper

Gecko

Goat

Chameleon

Spider

Lizard

Kingfish

Snail

Buzzard

Lobster

Grouper

Scorpion

Donkey

Did You Know?

Animals who need to see predators coming for them tend to have eyes on the sides of their heads, the better to look around them.

Predators tend to have eyes that point forward so they can judge the distance to their prey.

The eyes of vertebrates are very different in structure and function to those in invertebrates.

The first replanted mangrove trees in the north coast of Socotra

Kay Van Damme, Senckenberg Research Institute and Natural History Museum, Germany

In November 2015, two severe cyclones "Chapala" and "Megh" hit Socotra, causing severe damages to the marine and terrestrial environments and human settlements to the extent that this required immediate and continued assessment. Another cyclone followed in May 2018 – these events are not arbitrary, but an effect of Climate Change, and stronger than usual storms that allowed Socotran trees to survive for centuries. Many people lost their homes and many more were injured. In addition, the unique ecosystems lost a significant proportion of the endemic trees, destroyed by unusually strong winds, and even marine species, such as coral reefs, were affected. Friends of Socotra (FoS) launched at local request a crowdfunding initiative aimed at answering some of the environmental and sustainable development needs caused by the impacts of the cyclones. A modest FoS Cyclone Relief fund was established focusing on the local water harvesting point restoration, vegetation regeneration, home rebuilding, and a mangrove ecosystem restoration project.

These small and sustainable projects aimed mainly to enhance ecosystem resilience to the effects of Climate Change. The Socotra Archipelago had



larger coastal areas covered with mangrove stands in the past. Mangrove ecosystems represent a vital element of coastal and marine ecosystems, and provide enormous benefits to the environment as well as to people, especially those living in coastal areas. FoS decided to target this ecosystem through interventions responding to the cyclone effects and answering concerns expressed by local communities.

Mangrove trees in the northern part of the Island have died out in the last decades for several reasons, including human and natural factors. The Socotri people have traditionally used mangroves as firewood for making lime, both as building element and for plastering the houses. Other reasons for the decline include direct grazing, the use of mangrove wood for tools, as well as the aforementioned extreme weather conditions. Currently, mangroves only exist in the western part of the Island, in Shu'ab and Neet, which are two Nature Sanctuaries. However, these mangroves are in dire shape due to the reasons mentioned above, in

particular due to the devastating impact of the two cyclones which hit the Archipelago in November 2015, to great concern of the local communities.

Local associations, such as the Socotri Al Tamek Association for Protecting the Mangrove Tree from Ghubbah in the north coast of Socotra, requested our help. FoS joined forces with the Arab Regional Centre for World Heritage (ARC-WH) in the Kingdom of Bahrain to support the first successful replanting of mangrove trees in decades in the north coast of Socotra – a project suggested, initiated and implemented by the local Socotri Al Tamek Association and with technical and financial support of FoS and ARC-WH. Thus, the project helped create an environment for local biodiversity to thrive while promoting pride in local communities for their own ecological restoration of mangroves. These mangrove trees are thriving, acting as important carbon sinks, and contributing to local environmental education, as the local schools were keen to be involved in the activities.





trees in plastic buckets in order to protect them against crab predation.

Seeds and small seedlings were collected from the southwestern site in Shu'ab and grown naturally and replanted in three sites in the

implementing plantations in more sites in Ghubbah). This project is highly sustainable and its success is directly visible on the ground in the form of live, healthy mangrove trees. The children of Ghubbah love these little new mangrove trees and all stakeholders are hopeful that other projects will follow this example, however, the ultimate goal for this activity is to become self-sustainable and to generate its own income (for example through voluntary contributions).

The project started with communication between all stakeholders in FoS (Kay Van Damme) and ARC-WH (Haifaa Abdulhalim and Ismael Mohamed Salem) at the end of 2017 and was in effect in 2018 through that collaboration. It was agreed upon that FoS would provide funds for the activities alongside with a monetary contribution by ARC-WH and the in-kind technical assistance of its Focal Point for Soqatra, Mr Ismael Mohamed Salem, who oversaw the local activities. A written agreement was signed between all stakeholders and the local branch of the Environmental Protection Authority (EPA). Furthermore, during a visit of Mr Ismael to the ARC-WH headquarters, he used the opportunity of meeting the Supreme Council for Environment in the Kingdom of Bahrain in order to share experiences and to discuss certain techniques in regards to good practice in mangrove ecosystem restoration (such as replanting and the creation of nurseries). All contributions by FoS, EPA and the Al-Tamek Association were entirely voluntary. The total cost of the project was 3,633 USD - the contribution from FoS was 2,431 USD along with the contribution from ARC-WH equaling 1,202 USD as well as the in-kind staff time of Mr Ismael for the technical assistance to the implementation of the project. The monetary amount was used for building a nursery, local transportation, and the planting of

area in order to test the growth success in these different sites. In April 2019, a field visit of FoS (Kay Van Damme) with Mr Ismael showed the immense success of this project



in one of the three sites (Khor Ghubbah) with the first mangrove trees in the northern coast in Soqatra in decades, to great pride of the local communities in Ghubbah. In total, 83 young trees are alive and well, growing in this fenced site protected from grazing. At the FoS Annual General Meeting in Bahrain in October 2018 and during the field visit in April 2019, the continuation of support for this project was agreed, and progress will be reported in the next annual report. A more detailed report of this project can be requested from FoS.

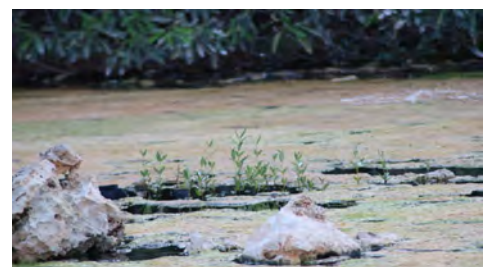
As a result of this joint FoS – ARC-WH pilot activity, the Al Tamek Association wishes to expand the mangrove plantation plot (increasing the numbers of trees and

As FoS, we wish to express our gratitude to the Al Tamek Association for the idea, its remarkable work and trust in the project stakeholders, as

well as to all who donated to the Cyclone Relief Fund, to ARC-WH for joining in this activity (in particular to Mr Ismael Mohammed Salem) and to the EPA Soqatra Branch for facilitating and

supporting the activity. This is a great example of a pilot project that illustrates the success of a low-cost, highly sustainable small-scale project, initiated at the request and meeting the needs of local Soqotri communities, as well as increasing local resilience to Climate Change effects.

If you have a chance to visit the island, please pay a visit to the Al Tamek Association in Ghubbah and see the first and only live mangrove trees in the north coast of Soqatra!



17th International Soqatra Conference and Annual General Meeting of the Friends of Soqatra (FoS)

Natural and Cultural Linkage on Soqatra

October 25-28th 2018

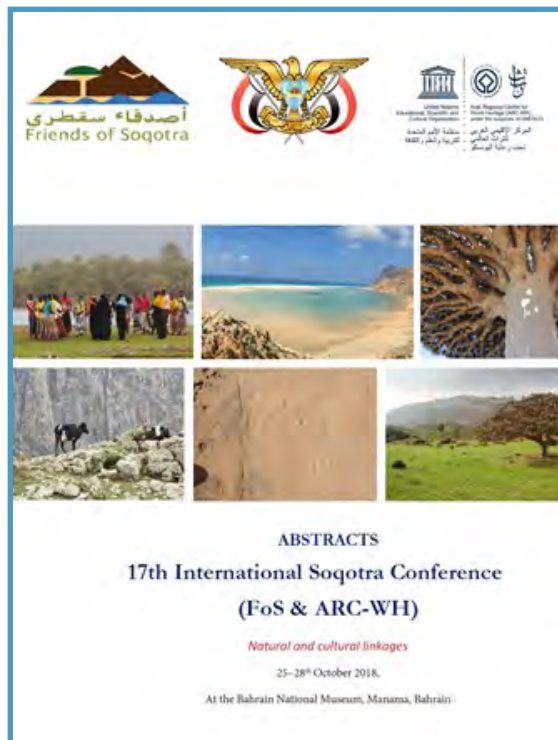
The 17th International Soqatra Conference and Annual General Meeting of the Friends of Soqatra (FoS) took place on 25-28th of October 2018 at the Bahrain National Museum (Bahrain Authority for Culture and Antiquities) in Manama, Kingdom of Bahrain. The plastic-free meeting was hosted by the Arab Regional Centre-World Heritage (ARC-WH) in cooperation with FoS, and with the consent of the Yemeni Government, approved by HE Ali Hasan Al Ahmadi, Ambassador of the Republic of Yemen to Bahrain.

This was the first FoS Annual General Meeting ever held in the Arab Region and the first international conference ever of its size that was solely dedicated to the Soqatra Archipelago. Since the First International Soqatra Conference in Aden in 1996 (of which the proceedings were published in a book edited by H.J. Dumont, in 1998), no scientific Soqatra meeting of this size had ever occurred in the Arab World. Although packed with lectures, the meeting was a great success and the topical workshops

were especially well received. The entire meeting was translated simultaneously by an excellent interpreter in Arabic and English, which greatly improved communication, and allowed Soqotri speakers to present in Arabic when they chose to do so.

The conference brought together a 76 participants from over 20 countries, members and non-members of FoS, including the largest group of Soqotri participants (15) to ever attend and present at a scientific meeting outside of Soqatra. Three Soqotri women pioneers, currently active in projects conserving natural and cultural heritage in the archipelago, presented with great passion during the official opening. In this aspect, the meeting was the first where Soqotri women stood on the foreground and opened an international scientific meeting. All Soqotri attendants were supported

by either the UNE-GEF-EPA nature conservation project on Soqatra, or by the Soqatra Cultural Heritage Project (the latter funded by the British Council). The atmosphere of the meeting was amazing, open and transparent, and with a joint passion for Soqatra nature and culture and their conservation. Representatives of UNESCO and IUCN were present.



During the four days of the conference speakers highlighted past and present research, shared their data and progress on projects, presented innovative approaches to conservation, activities and the latest multidisciplinary scientific studies related to natural and cultural heritage on Soqatra. A wide diversity of topics was covered including revisions of IUCN assessments of the Soqotri plants, an overview of women's handicrafts on Soqatra, extinction models of *Dracaena cinnabari*, procedures of the World Heritage Convention, protected areas management assessments and new insights for water management. During the working group sessions (cultural and natural heritage and sustainable development), participants discussed ways in which they could improve conservation efforts and brainstormed about sustainable practices, offering expertise and sharing knowledge with all present in an open atmosphere. Main topics included the importance of the rich biodiversity of the UNESCO Natural World Heritage Site, as well as impacts of climate change, soil erosion, unsustainable resource use and breakdown of traditional practices. Different working groups were formed according to these topics, presented each time to the audience by the Soqotri speakers in each group.

The closing ceremony concluded with a certificate for each Soqotri attendant and positive outlooks towards the future. All certificates

were proudly received.

In addition to the scientific talks, there was a small exhibition of Soqotri handicrafts showing locally made products by the local Soqotri women associations, and artworks by Soqotri children on nature. The internationally awarded film ***Socotra: Island of Djinns*** was presented by the Spanish director Mr. Jordi Esteva, at the Bahrain National Museum in conjunction with the international conference. The awarded black and white film was open to the public to raise further awareness and share the beauty, mystery and uniqueness of Soqatra. The film is entirely monochromatic and in the Soqotri language. Due to the large interest, the film was shown on two different occasions. Other films were shown by the Soqotri of the Cultural Heritage team presenting their impressive work on the ground, and an awarded film by Oliver Wilkins about Soqatra called ***Hidden***.

FoS wishes to thank ARC-WH for supporting the meeting and in particular the organising team in 2018 for their tireless efforts in preparing and hosting this event in a highly professional fashion and arranging everything perfectly to the smallest detail, and the Bahrain National Museum for facilitating the impressive venue. Much effort had gone into ensuring a smooth organisation, including making the entire meeting plastic-free! Thanks also to the UNE-GEF-EPA project and the British Council project for supporting all Soqotrian attendants who continue their hard conservation work for nature and culture on the ground.

The abstract book and programme of the Bahrain Conference, as well as the AGM minutes and the year's financial overview, are publicly available online (without restrictions) on the FoS webpages.



Scientific papers on Soqotra in 2018

Kay Van Damme, Senckenberg Research Institute and Natural History Museum, Germany

In 2018, around 25 publications related to Soqotra appeared in international journals. The biodiversity of Soqotra remains a very important subject and the number of new species discovered from the Archipelago keeps rising. In total, **three new genera and ten new species** were described from Soqotra. All of these new species include invertebrates from marine, terrestrial and freshwater environments, even from caves. Besides studies on taxonomy and biodiversity, several scientific articles in 2018 relate to Soqotran conservation, archaeology, palaeontology, ethnobotany, chemistry and general biology. New rock art sites were discovered on Soqotra as well, with similar motifs as in Eriosh. Of all plants, *Dracaena cinnabari* was investigated the most intensively. As in previous years, several members of FoS actively contributed to these scientific works. These studies can be found freely online, or can be requested directly from the authors.

Animal Biodiversity

On the **aquatic habitats** of Soqotra, two studies appeared in 2018 in *Zootaxa*. One is about the first record from Soqotra of a remarkable group of freshwater crustaceans, the **tadpole shrimp**. These are large and primitive looking freshwater animals that emerge from dried mud after rain in temporary pools and lakes, and they are nearly absent from Indian Ocean Islands. Van Damme reported in 2018 on the finding of *Triops* cf. *granarius* from the important archaeological rock art site Eriosh, an animal with very important ecological functions. These *Triops* are well known to reach high

numbers, and to eat mosquito larvae in temporary waters. In the **cave waters** on Soqotra, Fransen & Van Damme found a new species of **freshwater shrimp** (Atyidae), called *Halocaridinides soqotraensis*. The animal occurs in several places on the island like Erher, and is a remnant of an ancient marine fauna that adapted to freshwater environments in caves. Because the animals live in darkness, they do not put energy in making eyes or producing pigment and are completely milky white. Such adapted, underground freshwater animals are called **stygobionts**. These cave shrimp are special animals, because the closest relatives to the Soqotran species have been found quite far, in underground habitats in Zanzibar and Japan!

The **terrestrial invertebrates** made up the bulk of taxonomical papers in 2018. The studies on the planthoppers and the beetles are based on more recent collections by researchers from Czech Republic. Two new endemic genera with three species were described among the **planthoppers** (Hemiptera: Fulgoromorpha), a small type of insects living on plants. The new genera belong to the family Flatidae and were named *Medleria* (one new species) and *Socoflata* (two new species) by A. Stroinski, D. Swierczewski and colleagues (*Zootaxa* and *European Journal of Taxonomy*). The authors state that these species are most likely endemic to Soqotra and perhaps restricted to the area they were found in. *Medleria* occurs on the Diksam plateau, *Socoflata* is only found in the montane woodland of the Haggeher Mountains. The animals are only 2.5mm in length and well camouflaged, so they are hard

to see in nature. Among the terrestrial beetles, M. Geiser described two new species of **soldier beetles** (Cantharidae) in the journal *Acta Entomologica Musei Nationalis Pragae*. One is housed in a new genus, *Socotrasilis*, the other species belongs to the genus *Silidius*. This finding is unusual. The author points to the fact that not a single species of this common beetle family is known from the Arabian Peninsula or from the Sahara, therefore the new species in Soqotra are exceptional from a biogeographical perspective. In the same journal, A. Friedman described a new and very bizarre-looking beetle from Diksam and Shibehon, *Brachycerus socotranus*. The animal belongs to a family of **weevils** (Brachyceridae). Besides the descriptions of new species, taxonomists often redescribe species to better define their morphology. Zonstein and colleagues provided such a redescription in *Arthropoda Selecta* of an endemic genus of **palp-footed spiders** (Palpimanidae) from Soqotra, of which only one species is known, *Scelidomachus socotranus*.

In the **marine environment**, not many new species have been described from Soqotra in the last years. However, in 2018, three invertebrate species that had been collected from the archipelago were reported as new to science. These include two **bristle worms** (Polychaeta) from the genus *Branchiosyllis* studied by Lucas Rodriguez *et al.* in *Marine Biodiversity*, and one **brittle star** *Astrocladus socotrana* (Ophiuroidea) described by Baker *et al.* in *Zootaxa*. These specimens were all studied on older collections. The bristle worms were collected during the UNDP project in 1999. The brittle star came

from an expedition in the 1960s, the International Indian Ocean Expedition coordinated by the Oceanographic Commission of UNESCO, of which the collections are at the Smithsonian. These three species may be endemics, but it may be possible that they will still be found in other poorly studied areas in the Indian Ocean.

Plant Science

Dracaena cinnabari, the Soqatra Dragon's Blood Tree, is no doubt the best studied of all endemic plants in the archipelago. Also in 2018 most plant-related studies appeared on this flagship species alone. Several studies focused on the special properties of the dragon's blood itself, the unique red resin from Soqotra. Earlier studies suggested that phenolic compounds in *Dracaena* are the main important bioactive molecules. Al-Fatimi M. from Aden University studied the antifungal and antioxidant activity of Soqotran dragon's blood and compared the results to ethnobotanical data on the **properties of the resin (emzolah)**. In the study, which appeared in the journal *Plants*, Al-Fatimi confirms the effectiveness in traditional uses of the red resin for the **treatment of fungal infections in the mouth and of skin diseases**; the resin is most effective when dissolved in methanol. In addition to the previous research on the Soqotran dragon's blood, another study (by Al-Afifi and colleagues in *BMC Complementary and Alternative Medicine*) tested the oral toxicity of the resin in a methanol solution in rats, and found **no toxic signs** upon daily intake for 28 days. The authors concluded that the resin methanol extract can be "tolerated up to 2000 mg/kg body weight" in rats. However, of course, in large amounts, methanol itself is toxic. The same group of researchers (Al-Afifi et

al., in *Clinical Oral Investigations*) showed in another study that the resin of *D. cinnabari* has an effect on oral cancer in rats. The dragon's blood suppressed tumor development, working as a potential **anticarcinogen**. The chemical and medical properties of Soqotran plant-based products form an important area of research, building on ethnobotanical knowledge. This knowledge has been compiled several years ago in the monumental *Ethnoflora of the Soqatra Archipelago* by A.G. Miller and M. Morris (2004).

Other studies on the **Soqatra Dragon's Blood Tree** in 2018 were carried out by researchers at the Mendel University in Brno, Czech Republic. These include field measurements of **sap flow** for the first time, to better understand its adaptations to the extreme arid environment in comparison to other species, and across different ages of the tree. Using special sensors in the field, Nadezhdina and colleagues (*Tropical Plant Biology*), show that the tree responds to sun exposure and that the water transport may move in lateral directions within the trunk, as in other species. In another study, P. Maděra and colleagues (in the journal *Biologia*) investigated the growth dynamics of *D. cinnabari*, comparing **seedling growth** over an eight-year period in different sites with differing degrees of goat grazing and water provision. The authors conclude that regular watering and the absence of grazing pressure are important factors to determine seedling growth and survival of this tree.

One study appeared on the molecular analysis of **Punica** species, comparing the commercial *Punica granatum* to its close relative, the endemic Soqotran *P. protopunica* for potential use in **pomegranate**

breeding programmes. The study was carried out by researchers from Egypt, Yemen and Mexico (Youssef et al. in *Genetic Resources and Crop Evolution*).

Palaeontology

Studies on fossils are rare on Soqotra, yet two appeared in 2018. The **first extinct vertebrate** ever reported from Soqotra, was discovered by speleologists in Hoq Cave during one of the Soqotra Karst Project expeditions to the island. The skull of the animal, embedded inside a stalacmite in the cave, was identified and timed using a special carbon-dating technique. The skull belonged to an Egyptian **Fruit Bat** and could be reliably dated to the Early Holocene, revealing that the animal lived on the island over **7400 years ago**. These large bats no longer occur on Soqotra. As fruit bats consume a lot of fleshy fruits throughout the year, it is a question whether the environment could have supported larger populations during wetter periods on the island. In that case, the fact that the animal was unusually large for the species, may also indicate potential local speciation. Unfortunately only one specimen has been found so far. The study by Van Damme et al. appeared in *Journal of Natural History*.

In a study on much older fossils, Italian researchers M. Gaetani and colleagues give an overview of a group of **marine Triassic fossils** from the eastern outcrops of Soqotra Island (In: *Bulletin of Geosciences*). The Triassic period started about 252 million years ago and ended about 201 million years ago and was followed by the Jurassic. At that time, shallow seas covered most of Soqotra and marine fossils on the plateaus testify of this. The authors identified a group of invertebrates named Branchiopoda, of which now

only a few species survive in the seas, but these mollusc-like animals were widespread, counting thousands of species, in ancient times. One new fossil species was described by the authors, *Adygella socotrana*. Remarkably, the authors identified several other species that only known from the same period in what is now the **Himalaya**, a strong indicator of a former position of Soqotra next to India in the Triassic, as part of the supercontinent Gondwana.

Archaeology

Three articles appeared on **Soqotran rock art** in 2018 by J. Jansen van Rensburg, lasting testimonies of the presence of inhabitants on the island centuries ago. One study focuses on the geometric motifs and abstract imagery in Dahaisi cave, including inscriptions, vessels, animals and crosses (in: *Rock Art Research: The Journal of the Australian Rock Art Research Association*). No absolute dates were obtained, but the art in Dahaisi was attributed to several phases between the 1st century BC and the 15th century AD. A second study (in the journal *Arts*) gives a brief overview and history of the rock art at eight sites on Soqotra island, both inside caves like in Dahaisi and Hoq, and in the open air like at Eriosh. The author suggests that there is a strong connection between these rock art sites and water on the island. New findings were also reported on, such as a newly discovered rock art site with no less than 187 motifs including depictions of feet, crosses and geometric patterns. However, this new site is under immediate threat from development. The latter study appeared in *Arabian Archaeology and Epigraphy* and contains **two Soqotri experts** as co-authors, **Ahmed Saeed Ahmed Al-Orqbi and Esmail Mohammed Ahmed Salem.**

Conservation

One important study related to Soqotra conservation appeared in *PloS One* by **R. Vasconcelos, S. Carranza, M. Fasola** and colleagues, entitled *Combining molecular and landscape tools for targeting evolutionary processes in reserve design: An approach for islands*. This work anticipates the **future revision of the terrestrial Zoning Plan**, Soqotra's legal tool for the definition and laws of the different conservation zones, such as the National Park and the Nature Sanctuaries. Using special software for reserve design called *Zonation* in combination with the detailed distribution data of the **endemic reptiles** and their diversity at the molecular level, the authors produced a fresh look on the **design of protected areas** that protects the maximum number of reptile species, or the maximum number of genetic lineages, or both. It is clear from their work that the best conservation design for the reptiles, which are among the most important terrestrial vertebrates and the best studied animal group on the archipelago, differs a lot from the original and outdated Zoning Plan (from 2000). The reserve design based on the reptiles shows that in particular the existing **Nature Sanctuaries should be expanded, and new ones should be added**, with aimed protection. This is science at its best: using all the available scientific data and the most modern technologies, to objectively provide practical state-of-the-art tools for the conservation of key species.

In addition, several other studies discussed above include important notes on conservation. Maděra et al., in their study on the growth of the *Dracaena cinnabari* seedlings, mention the need for a

long-term (not decades but centuries) vision in local conservation planning to ensure survival through reforestation of this important flagship species. The need to **protect freshwater environments** on Soqotra is suggested in the paper on the tadpole shrimp *Triops* found in Eriosh, indicating the importance of conserving temporary lakes from a biodiversity perspective. It is also specifically noted in the study on the new endemic cave shrimp *Halocaridinides* from Erher cave, unique and rare inhabitants of special **cave ecosystems** that are threatened on a global scale. Finally, J. Jansen van Rensburg mentions the need for conservation of the **rock art sites** on Soqotra, about which many questions remain to be answered. It is clear that studies in 2018 actively emphasize the need for continued conservation efforts on Soqotra and, in case of the endemic reptiles, researchers provide practical suggestions to do so.

Climate

A few studies in 2018 analysed meteorological and hydrodynamic data on the **cyclones** Chapala and Megh, which hit Soqotra in 2015. In the journal *Ocean Engineering*, M. Akhturazzaman Sarker discusses data collected during Chapala and other cyclones to develop mathematical models that simulate cyclones in the Arabian Sea during such events. Such data can be useful for emergency planning and decision-making during cyclone events on Soqotra. In another cyclone study (*Theoretical and Applied Climatology*) the researchers J.P. Terry and G. Gienko look at the tracks of these tropical cyclones in the Arabian Sea to better predict the courses of future cyclones. They conclude that October monsoons follow much straighter tracks than in May, for example.

Other

Soqatra appeared in several books in 2018. One is a book of ca. 740 pages, *Corpus of Soqotri Oral Literature – Volume 2*, edited by V. Naumkin and L. Kogan, which appeared in *Studies in Semitic Languages and Linguistics*. This work includes folklore and ethnographic texts in Soqotri, translated in English and Arabic and annotated, following a previous volume that was published in 2014. A chapter on Soqatra appears in the

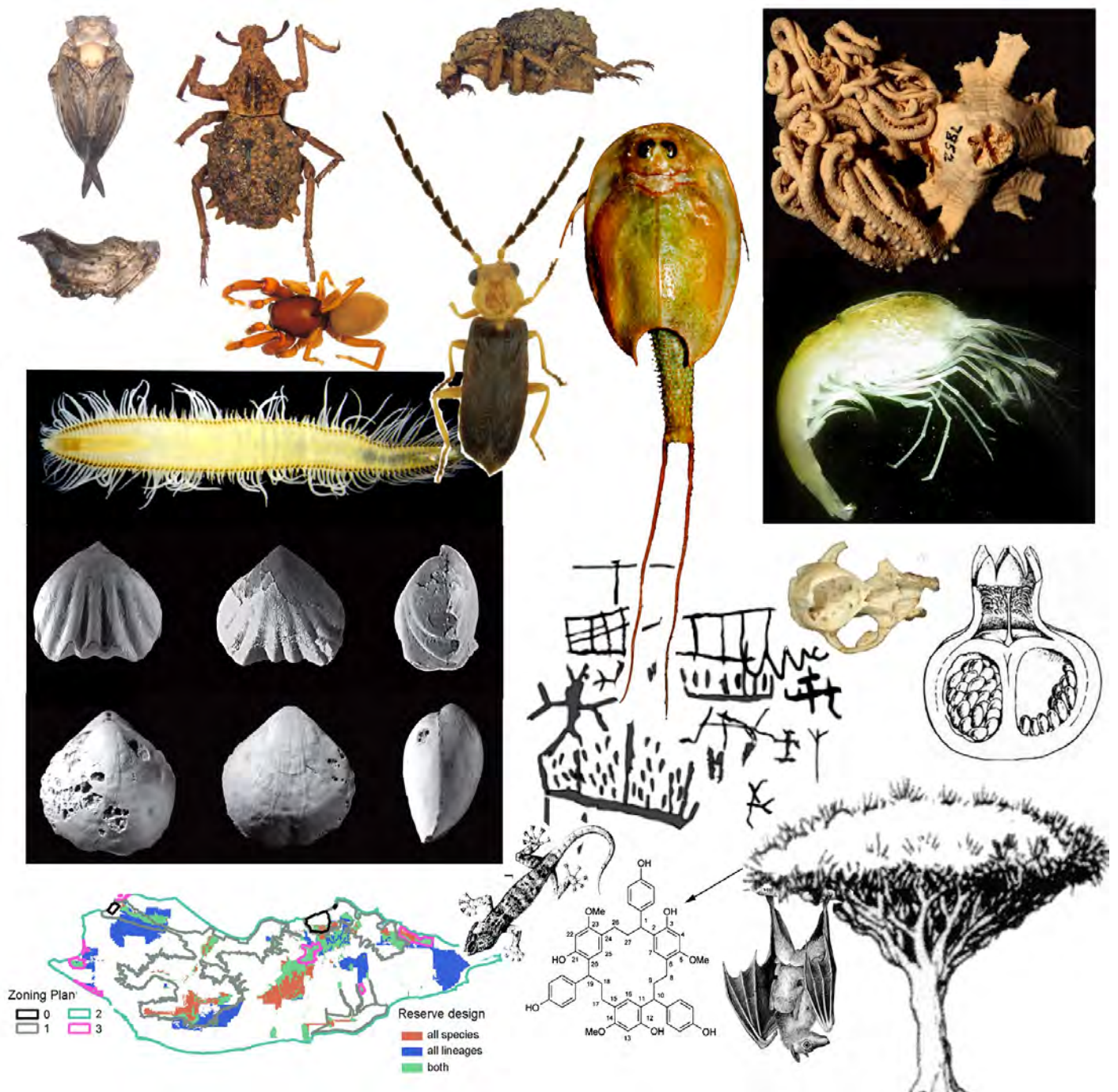
book *Coastal World Heritage Sites* by Claudino-Sales, mentioning challenges to the biodiversity of the UNESCO World Heritage Site in comparison to other coastal sites in the world.

Popular science journals *National Geographic* and *New Scientist* both included short articles about Soqatra in 2018 as well. In *National Geographic*, L. McCarron, briefly mentions that the biodiversity and culture on Soqatra are facing both climatic and

geopolitical challenges. The same author reports on his impressions of his first trip ever to Soqatra in 2018 in *New Scientist*, similar to the *National Geographic* article.

Image Caption: Scientific studies about Soqatra in 2018 included ten new species, three new genera and important notes on conservation of biodiversity and archaeological sites.

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IUCN Red Listed Freshwater Fauna of Socotra

Kay Van Damme, Senckenberg Research Institute and Natural History Museum, Germany

Most biodiversity studies and, as a result, most conservation efforts on Socotra, focus on the land and on the sea. The Socotran freshwater habitats are currently ignored in all management plans, do not receive a specific category or designation for protection, and no targeted conservation measures are taken. However, they should be protected!

Healthy aquatic environments on Socotra are important for humans and livestock, providing drinking water. A healthy aquatic environment depends on many factors and conservation efforts towards protecting biodiversity in these waters also aim towards the best water quality.

The terrestrial and aquatic environments are closely connected. Land use changes such as vegetation loss increases sediment run-off into the wadis, which may decrease the quality of the water. Through vegetation loss, valuable nutrients in the soil may be transported to the rivers and the sea, lost to the land, decreasing both land and water quality. The same is true for pollution: use of chemicals on the land results in an accumulation of these chemicals in waters. Links also exist through the food chains. Many aquatic inhabitants play a large role in the terrestrial ecosystems as a food source for other animals, like dragonflies and damselflies, which have aquatic larval stages. In addition, brackish waters and lagoons with a connection to the sea are rich in young fish species which are both important for fisheries and attract a large number of birds.

On Socotra, the surface aquatic habitats include the running water in springs and streams, the stagnant waters in wadi pools, the *leems* (Socotri), waters in the karifs, the

(often brackish) coastal wells, the brackish *khors*/lagoons, the few wetlands and marshes, the temporary rock pools and large temporary pools in the lowlands (like in Eriosh). In addition, many of the very small aquatic habitats, like small puddles or even water in moss, harbour life. Temporary pools are often forgotten in conservation, yet they harbour a special group of animals, crustaceans called branchiopods, of which endemics have been discovered on Socotra (*Branchipodopsis relictus*). Underground, large water reserves are present on Socotra and the karstic freshwater ecosystems are a completely different world, harbouring their own fauna.

To direct some attention towards conservation of the surface freshwater habitats, it is important to note that several endemic Socotran freshwater invertebrates have been included in the IUCN Red List (www.iucnredlist.org). In fact, freshwater (and semi-terrestrial) invertebrates are presently the only Socotran invertebrates listed! They therefore really merit some conservation attention. In total, six species are included: three crustaceans, two molluscs and one dragonfly.

Dragonfly

The endemic dragonfly is arguably the prettiest of the five. *Azuragrion granti*, the Socotran Bluet, is currently listed as Near Threatened (Schneider et al., 2013). Why are dragonflies important? They are one of the main consumers of mosquito larvae when they are aquatic larvae (which are called “nymphs” in

dragonflies), and when they are adults they catch mosquitoes when they just appear! Protect the dragonfly, and you have more impact on reducing mosquitoes than you would if using insecticides! The status of this species was changed from Least Concern in 2006 to a higher conservation category after an evaluation of data on the distribution and main threats. The species occurs mainly in the Haggeher Mountains. Major threats listed are general threats to the aquatic environment where these animals depend on for their life cycle. These include effects on the terrestrial environments that affect the aquatic environment through runoff: an increase in grazing pressures and deforestation. Other threats are infrastructural development leading to direct destruction of the habitat, extraction of ground water, pollution and drought. Schneider et al. (2013) suggest the following conservation actions: “monitoring and protection of water quality and population trends, together with research and protection through legislation, are needed for this species”. The Socotran Bluet could therefore be considered a flagship species mainly for the mountain streams, marshes and wetlands, which are all water resources that provide most of the people in the lowlands with freshwater. Protection of these waters is very important.



Crustaceans

The three crustaceans listed in the IUCN Red List for Soqotra are all crabs. Two are freshwater crabs (*Socotrapotamon*) that always remain in or near the water, and the third (Soqotra) lives in karstic rock holes and ventures out of the water. It should be considered as (semi-)terrestrial. All three crabs should be considered as very important, as they function as top predators in the aquatic ecosystems (as does Soqotra in the terrestrial ecosystem). They also clean up dead material in the streams, therefore keeping the streambed clean, and are important hunters. When they are young, they consume a large amount of small insects like mosquito larvae.

The best known species of the three aquatic/terrestrial crabs on Soqotra is *Socotrapotamon*

socotrensis. There is no English name yet, however such names can make a species more accessible to the public, and therefore enhance awareness and chances for conservation. An English name can be suggested here for *S. socotrensis*, as the “Common Socotra Freshwater Crab”. This animal is under the category Least Concern in the Red List (Cumberlidge, 2008), yet a more detailed overview of the distribution and population is needed. Cumberlidge (2008) notes that no conservation measures are known to be in place for this species and that it is not found in a protected area. However, this should be studied in more detail, because the animal is common in the larger Socotra National Park, and found in Homhil in a spring in the south and the large pool in the north (in the escarpment), which are part of the Homhil Nature Sanctuary. The species is also found in wadis and

pools in the lowlands.

We can consider *Socotrapotamon socotrensis* to be a flagship species of freshwater pools and wadis in the mountains, on the plateaus and in the lowlands. However, the status and threats to the populations of the Common Socotra Freshwater Crab should be evaluated. Cumberlidge (2008) notes that the species is “Listed as Least Concern in view of its island-wide distribution, its tolerance of a degree of habitat modification, presumed large population, and because it is unlikely to be declining fast enough to qualify for listing in a more threatened category.” But we do not know whether these statements are still true: the large populations of this species, commonly seen in 2000, have not

Socotra is a flagship species for the karstic environments on the plateaus of Momi, Diksam and Shebehon.

been seen again on Soqotra. The populations are in urgent need of assessment.

A second species of crabs that appears in the Red List is also a *Socotrapotamon*, *S. nojidensis*, and is only found in the Hazehaz/Berberher waterfall in Noged. This animal is listed as Data Deficient (Cumberlidge, 2008), but it seems very likely that it is restricted to this locality, which means its conservation value is much higher. No specific conservation measures are taken for the habitat of what could be named in English as the “Western Socotra Freshwater Crab” or the “Noged Freshwater Crab”.

The third and final species of crab is *Socotra pseudocardisoma*. This is the largest of the three. I’d like to introduce the name “The Socotra Karst Crab”, because of the close association with the karstic environment, living in rock holes. This species lives in rock holes in high humidity (water saturated habitats). It has also been evaluated as of Least

Concern, yet again its distribution should be evaluated in detail.

Cumberlidge (2008) argues the status assignment as follows: “there are no known long-term threats that may result in a decline in the extent and quality of its habitat. Its extent of occurrence is very restricted (less than 500 km²), and all individuals are in a single locality which is a limestone karst system. The inaccessible limestone karst habitat may provide it with a level of protection.” This is true, yet with land use changes and direct destruction of karst environments through construction, or roads, such large karstic inhabitants may be affected. We could say that *Socotra* is a flagship species for the karstic environments on the plateaus of Momi, Diksam and Shebehon.

Molluscs

The last species in the list are tiny freshwater molluscs. One is called *Gyraulus cockburni*, a little dark freshwater mollusc, an endemic only known from two areas in the south east coastal lowlands (such as pools in Wadi Kilisan) on the island, living on aquatic plants (Characeae). Because the genus *Gyraulus* is called Ramshorn in English, this species could be called the “Socotra Ramshorn” (just keep in mind it is only a few millimetres in size). The status of this species is Endangered (Neubert, 2012). Threats to the species are water extraction, water pollution, the use of anti-malaria pesticides and general decline of habitat quality. No conservation measures are in place for this species, and habitat monitoring (water quality) is recommended. The second is the endemic *Hydrobia balfouri*, listed as Data Deficient, and has never been found since the first expeditions centuries ago (Van Damme, 2012). The species needs to be revised taxonomically based on museum material.

Conclusion

In conclusion, the few IUCN red listed freshwater species keep up the flag for awareness and remind us how important it is to take care of the aquatic environment and its biodiversity. Protect the Socotra Freshwater Crab and the Socotran Bluet, and even the tiny molluscs! All these species need monitoring and updates on population sizes and distribution, in order to help protect their habitats. The waters of Soqotra also harbour an exotic species, the fish *Aphanius dispar*, which may

compete with the endemic dragonflies and the crabs.

The biodiversity in these waters testifies of good health of the aquatic ecosystem, from which all people on the island benefit.

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Have you seen this animal?

You can help to understand these species and their habitats better and help to protect the freshwater environments. Do you live on Socotra, or are you going to Socotra to visit? Shout out for freshwater environments! You can help the experts and help update distribution data by letting them know where you spot populations (preferably with photo and coordinates) of the **Common Socotra Freshwater Crab**, the **Socotra Karst Crab**, and the **Socotran Bluet** - any record helps! If you have concerns about freshwater environments in your area on Socotra, or you feel there is an urgent need for protection or improvement, you have suggestions or initiatives like school activities, or if you see chemicals (insecticides, etc.) being dumped in the water or are concerned about rubbish accumulating, contact the EPA.

For these species (The Crabs and the Socotran Bluet), or the freshwater environment in general, contact **EPA Socotra**, or **Abdulwahab Saad**, currently Biodiversity and Protected Area Management Expert of the UNEP/GEF/EPA project at Mobile: 00967 777750885, or email socotrison@gmail.com, or Kay Van Damme at kay.vandamme@gmail.com. For concerns about khors and lagoons, contact EPA, Fouad Khamees (imhorfouad@gmail.com) in the same project. Additional contact: Mazen Aldarhe aldarhemazen30@gmail.com - GD of the National Water resources Authority (NWRA) Socotra.



The **Common Socotra Freshwater Crab** (*Socotrapotamon socotrensis*) is an endemic genus widespread in wadis. They keep the water clean and feed on small freshwater insects, such as mosquito larvae. Easily recognized by the orange (sometimes yellow or red) legs and the dark carapace. IUCN Red List Category: LC (update needed). Photo by KVD.

The large **Socotra Karst Crab** (*Socotra pseudocardisoma*), also an endemic genus, lives in rock holes in the limestone on the plateau. A top predator on the ground that hunts during the night. These are terrestrial crabs, but their relatives are aquatic. IUCN Red List Category: LC (update needed). Photo by KVD.



The **Socotran Bluet** (*Azuragrion granti*) is an endemic species of dragonfly living mainly in the Haggeher mountains. They love eating mosquitoes and are a flagship species for the mountain streams and marshes. Easily recognized by the long body (longer than the wings), body with more black than blue, - and blue at the end (males). Females have a more golden to brown body. IUCN Red List Category: NT (monitoring and update needed).

Contact Information

Friends of Soqotra

Friends of Soqotra (UK Charity Number 1097546) was formed in 2001. Its distinctive rationale is to bring together people with backgrounds in scientific research and those with a more general interest and develops the synergies between them in order to:

- Promote the sustainable use and conservation of the natural environment of the Soqotra island group
- Raise awareness of the archipelago's biodiversity and the unique culture and language of the islanders
- Help improve the quality of life of the island communities and support their traditional land management practices



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Contact Friends of Soqotra

fos.secretary@gmail.com

[https://www.facebook.com/ FriendsOfSoqotra](https://www.facebook.com/FriendsOfSoqotra)

Secretary (General Correspondence):

Lisa Banfield

fos.secretary@gmail.com

Officers and Executive Committee:

Chairperson: Dr Kay Van Damme

Kay.VanDamme@gmail.com

Vice-Chairperson: Miranda Morris

Miranda@mirandamorris.com

Membership Secretary and Treasurer:

Dr Sabina Knees SKnees@rbge.org.uk

Website Manager:

Dr Dana Pietsch

dana.pietsch@unitubingen.de

Executive Committee: All above, plus:

Haifaa Abdulhalim,

Isam-Eldin Mohamed Ali, Fabio Atorre,

Salwa Barkwan, Peter De Geest,

Hana Habrova, Petr Maděra,

Vladimir Melnik , Hugh Morris ,

Eike Neubert, Martin Rejžek,

Tullia Riccardi, Dirk Van Dorpe,

Raquel Vasconcelos

Regional Representatives:

Germany

Dr Dana Pietsch,

Tubingen, Germany

dana.pietsch@unitubingen.de

Oman

Issam Khamis Thabit Al Soqotri,

P.O. Box 766, Area Code 211,

Governorate of Dhofar, Sultanate of

Oman

Telephone: 00 968 95485734

Gulf States

Shukri Nuh Abdullah Al-Harbi Di-Kishin,

P.O.Box 1590,

'Ajman, United Arab

Emirates

Telephone: 00 97150 5775678 or

00 97150 2320808

Soqotra

Ismael Mohammed, local coordinator

TABE'A and joint Friends of Soqotra/

Arab Regional Centre for World Heritage

projects.

i.salem@arcwh.org

Tayf

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Friends of Soqotra Website

<http://www.friendsofsoqotra.org>

The Friends of Soqotra website is managed by Dana Pietsch. It provides information on completed and ongoing scientific research on the Soqotra Archipelago including data, bibliographies and contacts of institutions and research teams. The structure and layout also includes a page in the Arabic language which gives some general information about FoS. If you would like to submit content for the website, please contact: dana.pietsch@unitubingen.de



All across the world plastic that has been used once and thrown away is a major problem. It harms animals at land and sea, the toxins within them get into the water and then into fish and ultimately into people.

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