World Wetlands Day

On Friday, 3.2.2017, Campus Teva invited the general public to celebrate World Wetlands Day. The program included a guided tour of the Botanical Garden, focusing on wetlands. During the tour the visitors collected water samples from various ponds in the Garden. At the end of the tour they gathered in the open-air classroom, where they were invited to examine through a magnifying glass the water samples they had collected and discover the tiny creatures that live in the water. An amphibian exhibition was also on display in the classroom, which included an Eastern spadefoot toad, Spanish newt, green toad, and Levant water frog – tadpoles and adult frogs. The visiting children enjoyed a craft workshop, in which they prepared an origami frog, which turns from tadpole to adult and back.
The Zoological Garden Newsletter

The spadefoot toads are breeding and released back into nature

On the 13th of February a team of researchers, students, and animal keepers from the School of Zoology at Tel Aviv University, with the coordination and cooperation of the Israeli Nature and Parks Authority, reintroduced spadefoot toads from the Zoological Gardens' breeding colony back into nature.

The Eastern spadefoot toad is a critically endangered species in Israel. Its tadpoles are very large and require a lot of time for metamorphosis: several months from hatching to the terrestrial phase. Thus, in order to reproduce the spadefoot toads need seasonal water bodies that are able to retain a significantly large volume of water for several months.

The breeding colony in the Zoological Garden was established about four years ago, in order to serve as a temporary "Noah's ark" for the last of the newts and spadefoot toads of the Zvulun Valley populations. During that year, 2013, a shopping center was built on what remained of the Zvulun Valley swamps, which had once covered all the area that is known today as the Krayot, the industrial area, and Haifa port. The last water pond of this magnificent swamp area, the Checkpoint water pond, has given way to a shopping center.

Amphibian populations from different areas in the country slightly differ genetically from each other. Part of the uniqueness of each population is expressed in the way it is adapted
to the local habitat, and part is a coincidental variance that currently has no functional importance but contributes to the species' genetic diversity. This is why it is specifically important to try and save the last remaining representatives of the Zvulun Valley population, although other newts and spadefoot toads live in other parts of Israel. The breeding colony in the Zoological Garden serves as a resource for reintroducing these populations back into nature, to a suitable location in the area from which they had originated or to a location nearby. Since most of the area has undergone massive development and there are no natural populations of spadefoot toads or newts there, the hope is that in the next few years an alternative winter pond will be established near the former Checkpoint winter pond. The new pond will have statutory protection from development of the area and could serve as a long-term natural habitat.

This year, at last, the dedicated caring for the spadefoot toads has borne fruit: those that were collected as tadpoles from the Checkpoint winter pond four years ago have matured and bred. Clutches have been observed and thousands of tadpoles have hatched from the eggs.

About 2,000 tadpoles and several dozen adult toads have been released in two different areas, whose precise location is confidential. This release action constitutes a milestone in amphibian conservation in Israel: it is the first time that spadefoot toads from a breeding colony have been reintroduced back into nature. In Israel, no amphibian species has ever
been reintroduced back into the area from which it had become extinct as a result of land development. We still have a lot of work to do before reaching this goal, but the spadefoot toads have already gone a long way, and the safe shores (of the seasonal winter pond) are already seen on the horizon. With a bit of luck and a lot of insistence, our spadefoot toads will reach it.

Our amphibians are breeding

In January the mating season of our amphibians was at its peak: the spadefoot toads, which started to breed about two months ago, continued to copulate and lay eggs. The Middle-East tree frogs and Levant water frogs have also bred successfully.

In the photos: a. Levant water frogs mating, b. egg strings of Eastern spadefoot toads, c. tadpoles of Levant water frogs, d. Middle East tree frogs mating

Garden news are also available at our website
A new aviary for thicket birds

A new aviary for thicket birds is now under construction in the Zoological Garden. The aviary is built as part of the Zoological Garden masterplan, developed in light of new and modern concepts of animal welfare. The aviary is being built atop the structure of a large research cage in the eastern part of the Garden (opposite the wild boars and turtle pond). The walk-through aviary will be populated with a variety of thicket birds. As part of the renovation process the mesh netting has been repaired, new soil introduced, characteristic plants planted, a water pool dug, and a pathway built.
A new and renovated cage for the caracal

Our caracal has a new home: the two middle cages in the northern-eastern cage row. These cages face east and receive more light compared to its previous cages. One of the two cages has also been renovated and allows the caracal better use of the space. The renovation works were carried out by devoted volunteers – high-school students from Sde Boker, Prof. Noga Kronfeld-Schor's children, and Dr. Ron Elazari-Volcani’s children. The second cage will be renovated soon. Those who would like to volunteer – please contact Ron.
Taking care of the vegetation in the Zoological Garden

Sivan Biton, who joined the Zoological Garden's staff, has vast botanical knowledge. She uses this knowledge to nurture the vegetation inside and outside the cages and on the main grass area. Sivan has planted a variety of plants in pots and created a reservoir of plants to be introduced into the cages and in various areas of the Garden. The plants will be used both for enriching the animals' diet and as additional greenery in the various areas of the garden. Sivan also studies which plants are resistant to the grazing pressure of the gazelles and nene geese. To date she has found that myrtle, sage, narcissus, and *Pancratium* are not eaten by the animals and so can be planted in the main grass area. Another important project that occupies Sivan is that of trying to grow shrubby saltbush. This plant is very important for the fat sand rat's diet and at the moment the animal keepers have to bring in saltbush from outside the Garden. If we could grow saltbush here, time and cost will be saved.
Happy news about our vultures

On January 30th our old vulture pair laid a first egg for the current breeding season. It turns out that this was the first egg to have been laid this season in any vulture breeding colony in Israel. Those of you who follow our Garden News probably remember that this pair is very fertile: last year they laid an egg that was then taken for incubation in the national incubation center for Israeli birds of prey at the Jerusalem Biblical Zoo. The pair then laid a second egg, which was also taken for incubation. After a period of incubating a dummy egg, they received a vulture chick and raised it successfully. This is also the plan for the current year: on the 9th of February, Igal Miller from the Israeli Nature and Parks Authority took the egg for incubation and we are now waiting for the female to lay a second egg. After laying the second egg the pair will get a dummy egg, and later – a chick. It is important to note that incubation success in an incubator is higher in comparison to incubation in the parents' nest. This is why we also take the second egg for artificial incubation and don't leave it in the nest.

In the photos: Alex Lifschitz stands on the nest and passes the egg to Igal Miller (right), Igal is holding the egg (left), photos: Noga Kronfeld-Schor

Garden news are also available at our website
The barn owl has gone too far!

An Israeli barn owl, with a Tel Aviv University ring on its foot, has crossed the border and was captured in Jordan. The story was published on YNET: a surgeon from the Jordanian town of Irbid was visiting the local market and surprised to see a white barn owl for sale. He noticed that it was in bad physical condition, bought it, and started treating it at home. While treating the owl he noticed a metal ring on its foot, engraved with an English inscription from Tel Aviv University and the no. GG25532. Through Facebook he contacted Prof. Noga Kronfeld-Schor, head of the School of Zoology and told her about the barn owl. Prof. Yossi Leshem checked the number and found that the barn owl is a male that was ringed on May 2014 in the palm grove on Kibbutz Shluhot, as part of the national project of using barn owls and common kestrels as biological pest control in agriculture. Prof. Leshem contacted the Jordanian project partner, General Mansur Abu-Rashid, and offered to pay the doctor for the medical treatment. The doctor refused any payment for his efforts and when the owl had recovered and was able to fly again, he transferred it to the Jordanian general.

A few words in their memory

Last month we said goodbye with sorrow to our hyena and one of our two crocodiles, both of which had died of old age.

Our hyena, which had loved eating watermelons more than anything else, arrived at the Garden as an adult about 15 years ago from Hai Bar Yotvata. It was probably born in Haifa Zoo, more than 18 years ago, as one of three cubs. It arrived at the Zoological Garden as a potential mate for Nela, a female hyena that lived here, but the pairing was unsuccessful. When they first met (after a period of acquaintance from a distance), they attacked one another so fiercely that Dr. Ron Elazari-Volcani had to operate on the male in order to rehabilitate its face, jaw and teeth.
From the day of surgery and until the day it died, the hyena hated Ron's guts.... it had probably forgotten why it hated Ron, but still held grudge against him.

In spite of the failed trial, the hyena's keepers didn't give up. Since the striped hyena is a solitary animal and the female heat period is very short, the keepers wanted to identify the exact time of the heat in order to bring the two together at that time. A mesh barrier was built between the cages and the keepers and students who worked in the Garden were asked to pay attention to the pair and report any interaction between the two. One day, one of the students working in the Garden came running to Ron, and reported that the female had urinated near the barrier and that the male was sniffing the urine with interest. The entire Garden staff quickly organized: after the keepers had been equipped with water hoses, a tranquilizer rifle, brooms, and photographic equipment, the doors of both cages, which open to the big yard, were opened. The two hyenas left their cages for the yard, sniffed one another, and then began fighting again…After they were separated we finally understood that the pair had no future together. The female, which was older than the male, was transferred to the Abu-Kabir Zoological Garden and the male stayed with us.

And what can we say about our Nile crocodile, which was at least 40 years old when it died? Between 1973 and 1976 several crocodiles and crocodile eggs arrived at the Abu-Kabir Zoological Garden. Prof. Mendelsohn successfully incubated the eggs and young crocodiles were added to the Garden. One of the crocodiles, we are not sure if it was one of the young ones or one of the adults, arrived at our Zoological Garden, and for many years was one of our big attractions for visitors. Hair-raising stories are still being told today about the first years of the crocodiles in Abu-Kabir: One of the crocodiles succeeded to escape and managed to get as far as the water pool in the nearby Botanical Garden, where he surprisingly snapped at one of the professors who was busy taking water samples from the pool. Another crocodile was revealed as the cause of the sewer blockage. When one of the zoo keepers inserted his hand into the sewer to open the blockage, he pulled it back with a young crocodile attached to it, gripping his hand with its teeth!
Zoological Garden newsflash

Those of you who have walked in the Garden lately may have been surprised to see our roosters walking in the big water pond on the main grass. No, we haven’t developed a new species of “water chicken”. The reason for this peculiar habit is simple: although our roosters have enough food, they really love eating the moist dog pellets floating on the water that serve as food for the flamingos and glossy ibises.

As part of our animal footprints project, a branched asphodel (Asphodelus ramosus) was planted near the porcupine footprints and its digging marks, enabling our visitors to understand why the porcupine had dug exactly there.

As part of the breeding management of our jungle cats we decided to separate the male from the female and her young. The male has received its own suite – the first two cages in the north-eastern part of the Garden.

These days, our three wolves have nice thick winter coats. During the last two weeks frequent aggressive interactions have been observed between the two males, an indication that the young wolf (no. 2) is trying to challenge the adult male (no. 1), and become the dominant. In the meantime, no. 2 is still losing from time to time, but keeps up his militant mood. We, together with the female wolf, will wait patiently and see how the situation develops.

Garden news are also available at our website
The Safari is in town

Representatives from the Safari zoological center in Ramat-Gan came to visit the TAU Botanical Garden and consult with our team. The animal exhibitions at the Safari display elements from the natural habitats of these animals, including the relevant flora. The aim of this meeting was to explore new ideas for vegetation at the Safari, both inside the animal cages and in the barrier zone.

Perhaps, in the near future, plants originating from TAU Botanical Garden will be on view at the Safari; however, we do not expect a reverse migration any time soon.
Under construction – The Garden’s new entrance

The entrance to the Garden has been temporarily moved due to work on the Museum of Natural History. The new entrance bypasses the Museum construction site. Construction is expected to last several months, and when completed the Botanical Garden will feature a new entrance plaza. We apologize for the inconvenience.

Mandrake in bloom – Successful relocation

Last November we reported the relocation of several of the plants growing in the semi-arid batha plot. Among them were two mandrake plants, which are characterized by a thick branched taproot, necessitating that the gardeners dig deeper than usual. This was accompanied by some concern, since they are the only representatives of this species in the Botanical Garden, and relatively hard to grow. In early 2017, to our relief, we found that one of the mandrakes had started to bloom. Leaf emergence has now started in the second one and we hope that blooming too will occur soon. It seems that the relocation has been successful!
Quiet on the set!

During last Hanukkah, our wetland plot was temporarily transformed into a movie set for the film "Between Two Hills". The wild scenery of the garden presented a suitable background for the film by Matan Gordon, a Film & Cinema student at Minshar College. The film is a romantic comedy taking place in no-man’s land under a “democratic martial law”. It depicts the story of Fadi and Shalhevet (Ala Dakka and Noa Raz), who meet one another midway in a magical place in the dark.

The production is collaboration between students from Minshar College and the Tisch School of Film & Television at Tel-Aviv University. Similar student projects too have found inspiration in the Botanical Garden, which is pleased to support such productions.

A new-old tenant

A new *Viscum cruciatum* plant (Mistletoe) was discovered recently in the garden, occupying a branch of a *Crataegus azarolus* tree (a species of hawthorn) in the Mediterranean scrub plot. Roi Chividali, the gardener who identified the plant, was delighted to find it after the species hadn’t been seen in the Garden for so long. *V. cruciatum* is a semi-parasitic plant. It has green leaves and therefore photosynthesizes, but it also attaches to a branch of a tree (or a shrub) and draws its water and minerals from the host. Its Hebrew name, olive mistletoe, was given to it because in southern Europe it is

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found mostly on olive trees. However, in Israel it can be seen on other tree or shrub species, such as almond, hawthorn, and Buckthorn (*Rhamnus*). The seeds of *V. cruciatum* were first brought to the Garden in 1975, sown directly onto several plants in the scrub plot, and one *V. cruciatum* became easily discernible on a large olive tree. However, it had not been seen in recent years and we feared that it no longer existed in the Garden. In 2013 fruit of this plant were collected from the Valley of the Cross area in Jerusalem and glued to the branches of three olive trees around the garden; but unfortunately this "infection" attempt didn't seem to work. *V. cruciatum* is naturally dispersed either by birds or when the sticky fruit fall from the mother plant and then adhere and germinate on the lower branches of the same tree or on adjacent trees. The first researcher to investigate the germination mechanism of *V. cruciatum* was Prof. Jacob Galil, the founder of the Botanical Garden, who discovered that germination of the seeds is very slow and occurs without the presence of water. Now that the plant has been re-discovered, it seems that even though they had not been visible in the Garden, at least some of them had survived and been dispersed via one of the known methods.

**Lion’s tail, Swan’s neck, & Foxtail – in the Botanical Garden??**

*Agave attenuate* is a succulent native to central Mexico. It has a large symmetrical impressive rosette of leaves, green-grey in color, without thorns (the only agave without thorns and the reason for its being so popular in gardening). *A. attenuate*, like other Agave species, flowers only once and afterwards dies (i.e. it is monocarpic). Blooming occurs only in mature plants (usually when the plant reaches about 10 years old, and sometimes after several decades). The mother plant then dies, but leave several buds.
created in vegetative reproduction. The inflorescent bent stalk can reach 3 meters in length. The curved shape has led to its many creative common names, such as Swan’s neck, Lion’s tail, and Foxtail.

At the beginning of December, a 20-year-old *A. attenuate* plant flowered for the first time. Despite the expected sad death of the mother plant, many buds have emerged from it and we will patiently wait for them to bloom.

**Invasive species watch out – retirees ahead!**

This is the fourth year that America-Canadian volunteers have come to work in the Botanical Garden as part of the CAARI project (Canadian-American Active Retirees in Israel). This unique project, founded by the JNF, has been running for the past 34 years. The participants are Jewish retirees who work within several frameworks in the community, one of which is the Botanical Garden. Six volunteers are currently working in gardening and in the seed collection, for two of whom it is their third time with us. They say that the reason for their return is the combination of the Israeli weather, working outdoor, and the great company. As part of their work the volunteers have adopted a plot in the Israeli plants collection. They are engaged in a stubborn struggle against the invasive species that attack the plot.

The results of their hard work are evident, as the concentration of *Oxalis pes-caprae*, an invasive species, has declined dramatically. Moreover, colorful anemones and other geophytes, with which Oxalis competes, have returned to bloom.