



The Zoological Garden Newsletter



Enrichment, enrichment, enrichment

Environmental enrichment - the various actions and means that are used in order to diversify the daily routine of zoo animals – has become an inseparable part of the Zoological Garden's daily life. Our keepers are kept busy in planning, building, and implementing enrichment tools for the various animals that live in the Garden, and the results are evident. All the enrichment projects are led by the animal keeper Nava Schiller, with the help of Ron Elazari-Volcani, the Director of the Garden. In addition, as part of the University course "Research, conservation, and education in zoos", several enrichment projects have been carried out for the jackals, chameleons, agama lizards, jungle cats, Nubian ibexes, little owls, ravens, and fennec foxes. All the course's projects were planned, built, and implemented by the students who took the course, with the help of our animal keepers.



Right: Our caracal enjoys a hammock built from fire hoses; left: a scratching pole for jungle cats. Design, implementation & photography : Nava Schiller



Gardening work for the chameleon welfare



Meat is served to the wolf up on a tree, in order to make him more active, Photo: Lior Twig



Enrichment tools for fennec foxes



A raven in a "surprise box"

New tenants in the Garden

About three months ago, as part of our collaboration with the [Wildlife Hospital](#) at the Safari Park in Ramat Gan, we received two injured spur-winged lapwings for rehabilitation. The two spent a recovery period in the thicket aviary, and were then released onto the main grass. It's possible that after they fully recover they will decide to leave the Garden; but it's also possible that they will decide to make it their new home.

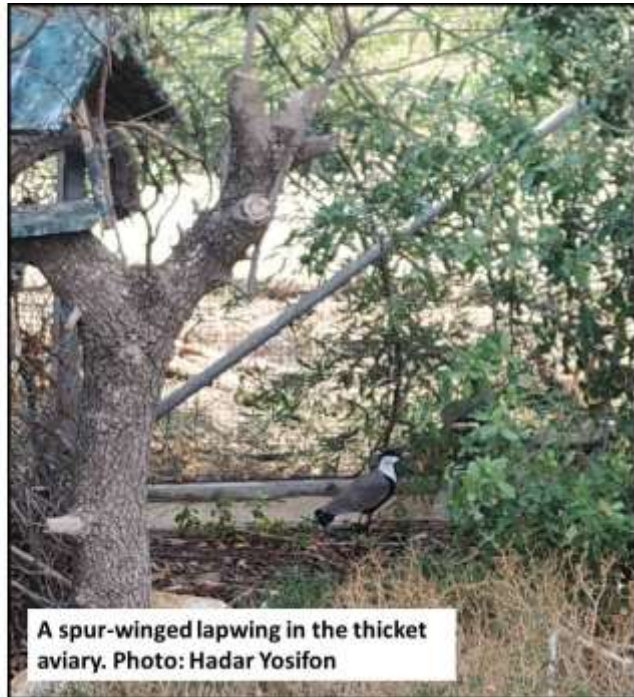
Garden news are also available at our [website](#)



About the same time that we received the lapwings, we also received a jay with an inflamed leg. At the request of the Wildlife Hospital the jay was admitted to our clinic. It got well and has recovered, but will suffer from a permanent leg disability and will not be able to live in the wild. So we are now looking for the right place for it among the Garden's exhibits.



The jay during its rehabilitation.
Photo: Emanuel Bar



A spur-winged lapwing in the thicket aviary. Photo: Hadar Yosifon

New young tenants in the Garden

Some of the Garden's newest tenants are youngsters that were hatched or born here. In mid-July several Mandarin ducks hatched, and will later take part in Dr. Gal Ribak's research on the "[biomechanics and energetic cost of swimming in water birds](#)"; the two little bittern chicks, which hatched in the thicket aviary, are maturing; of the two eggs we found in the stork's nest, which



The young stork on its first flight.
Photo: Ron Elazari-Volacni

they built in the middle of the main grass, two chicks hatched but only one survived.



He has grown up and is already flying in increasing circles above the main grass. Maybe one day he will decide to leave us and join a flock of wild stork. Last but not least, our fennec foxes have produced several young and cute cubs.



Right: Young bittern chicks in the thicket aviary; top left: young Mandarin ducks; bottom left: the Mandarin ducks in the research apparatus. Photos: Hadar Yosifon

The renovation works continue

Throughout the Garden we are continuing the renovation works that are being carried out both for the welfare of animals and for the welfare of our visitors. We have started the construction works for a significant expansion of the jungle cat exhibit, which required us to find a suitable place to relocate the cormorants. We decided to try and release them onto the main grass, following an acclimation period. In order to do so, animal keeper Juan Velasques built a large and portable acclimation enclosure that can be moved to different areas in the Garden. The enclosure was placed on the main grass, and the cormorants spent a short acclimation period in it. Later, after they were released, they immediately started to enjoy swimming in our big pond that is now available to them. In the pond we have built several artificial islands on which the cormorants can rest.



We are now planning to use the portable enclosure as temporary housing for our Hawaiian goose (nene) chicks and greylag goose chicks. This enclosure will allow us to move the chicks from time to time to different places on the main grass, so that their diet can be based on fresh grass.



Starting the work to expand the jungle cat exhibit. Photo: Ron Elazari-Volcani



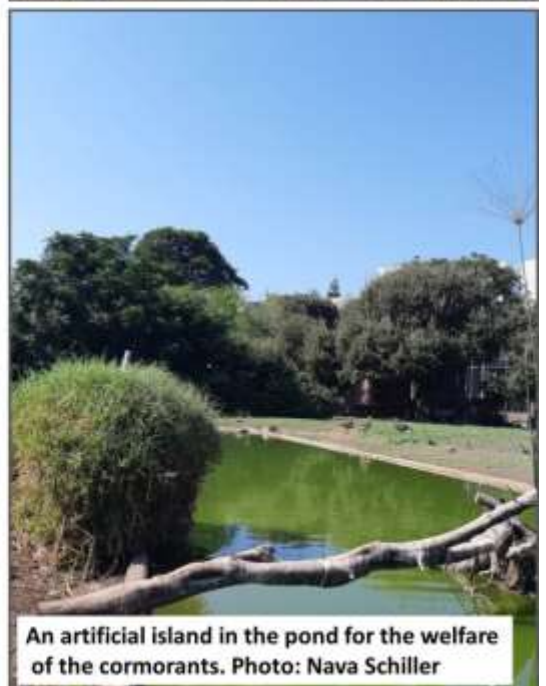
Renovating the western path. Photo: Ron Michlin



Placing the portable enclosure on the main grass. Photo: Hadar Yosifon



Renovating the western path. Photo: Ron Elazari-Volcani



An artificial island in the pond for the welfare of the cormorants. Photo: Nava Schiller



With great sadness, but with a recognition of reality, we have said goodbye to our fallow deer. Considering their aggressiveness towards each other for many months of the year, and the need to separate them due to this behavior, we realized that we needed to find them a more suitable home. In cooperation with the Israel Nature and Parks Authority, the deer were moved to Hai Bar Carmel. We wish them a good, long, and peaceful life there. In the area that they had occupied we are now planning to build a desert aviary that will be connected to the ibex exhibit, and thus provide a more spacious exhibit for all the desert animals. We have already started to renovate the western path of the Garden. The path is being re-planned to take into consideration the renovated exhibits of the ibex and the planned desert aviary.

The restructuring of the restrooms (an accessible restroom and a standard restroom) next to the gate between the Zoological Garden and the Botanic Garden has now been completed and the restrooms can be used by our visitors.

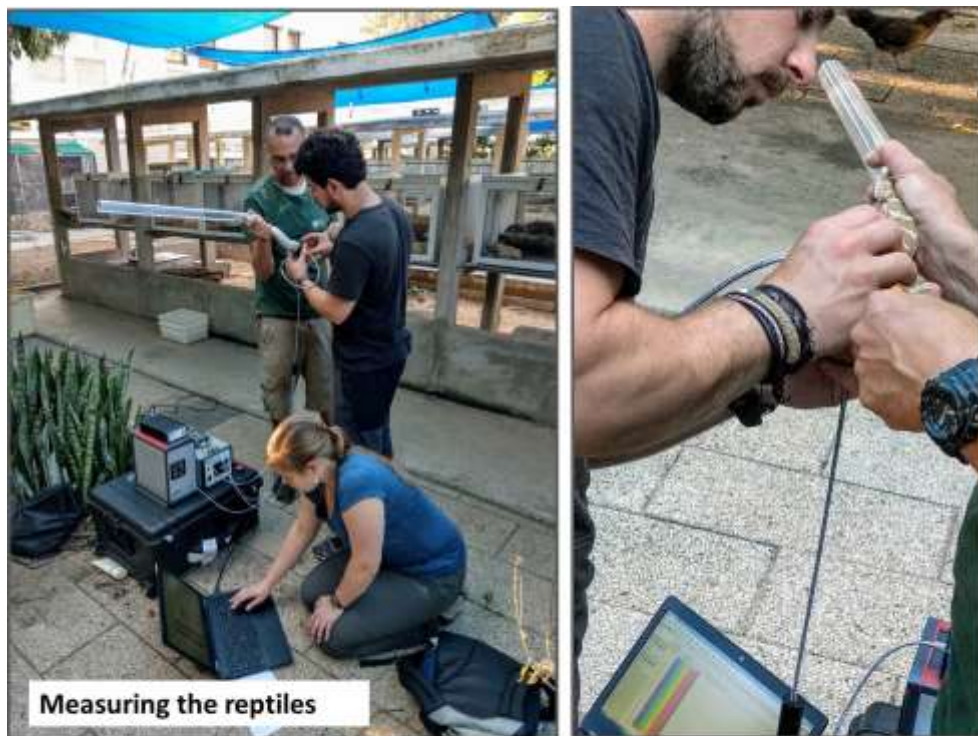
News from the reptile yard

- ✚ During the last week of September, the Israel Nature and Parks Authority holds a snake-catcher course at the Jerusalem Biblical Zoo. All the snakes used for demonstration and teaching in the course are usually snakes from our reptile collection. This year, however, the Israel Nature and Parks Authority needed species of snakes that we didn't have in our collection, so it trapped snakes of those species and gave them to us. After the course is over we will keep them here, for purposes of teaching and education.
- ✚ Our large reptile collection was used recently by Jonathan Goldenberg, a PhD student at Ghent University, Belgium. Jonathan is studying the thermal properties and the evolution of the colored integument of Squamates. The aim of Jonathan's study is to unveil how future climatic projections will shape the distribution of these animals. His study is part of a larger research project, in which researchers are seeking to understand how the brightness of reptile skin undergoes change as a result of various environmental pressures. Using the information gathered, the researchers are building a model capable of predicting how the different species will cope with climate change. In the Zoological Garden, Barak Levi, one of our animal keepers, and Karen Bisschop, a student from Ghent University, assisted Jonathan to take reflectance measurements from 30 different species of snakes and lizards, using a spectrophotometer. The measurements were taken



from both sides of the animals and, when measuring the venomous snakes, tubes were used to contain the snake, according to its thickness and length. This proved to be an interesting and exceptional experience for all parties involved.

- ✚ Reproduction in the reptile yard! At the beginning of September, Barak Levi found in the wedge-snouted skink's (*Sphenops sepsoides*) enclosure a young skink. In this species the females do not lay eggs but produce live individuals.



Measuring the reptiles



A day-old wedge-snouted skink, photo: Barak Levi



The Botanical Garden Newsletter



Fighting flies

Every summer we feel the return of the annoying mosquitos, especially around the water ponds throughout the Botanic Garden.



Until a few years ago, the common house mosquito (*Culex pipiens*) was the dominant species in Israel, but then, in the early 2000s, the Asian tiger mosquito (*Aedes albopictus*) invaded our country. This species is active during daytime and can sting several times within a short period of time. The main problem with the tiger mosquito is its ability to reproduce in even the smallest amount of water.

The plant collections in the Botanic Garden comprise an artificial system that functions as a semi-natural ecosystem. Within this system, plants and animals maintain interactions that are important to this functioning. We strive to maintain a stable system and to minimize disturbances to it as much as possible. Consequently, we seek to conduct pest control (for



the benefit of both plants and humans) within the Botanic Garden territory in the most target-specific and scientifically updated manner. The Garden's team keeps track of the newest developments in the field of pest control, especially in regard to mosquitos. A detailed program has been designed, beginning with a special team workshop that took place in the summer. This workshop, led by Itai Kahana from the National Center for Aquatic Ecology, included an introduction to mosquito morphology and life cycle, a demonstration of monitoring methods and equipment, and a monitoring tour in the Garden. Mosquito treatment in the Botanic Garden is carried out in several ways:

1. Several fish species, including the western mosquitofish (*Gambusia affinis*) that feed on mosquito larvae, are present in all the major water ponds in the Garden.
2. A specific pest control substance (Fourstar), which is a bacterial toxin deadly to mosquito larvae but harmless to other animals, is introduced into all the water bodies in the Garden. It works through a slow-release mechanism.
3. A silicon substance (Aquatain) is sprayed onto the water pockets between leaves in the Tropical Plants house.
4. We strive to prevent un-wanted water accumulation, especially in the Garden's nurseries.
5. All the Garden's water bodies are monitored according to the guidelines of the National Center for Aquatic Ecology.
6. We are still at the beginning of the process and it will require careful monitoring until we can sense that a significant change has taken place. We hope to feel relief soon, and not just because autumn is coming.

Autumn is coming

The harbingers of autumn are proudly lifting up their heads and beginning to flower around the garden.

The first to flower is *Urginea maritima* (sea squill),

which can be found in impressive clusters at the edge of the Menashe Garden of Medicinal Plants. Why is *Urginea maritima* included in this collection? The large and toxic bulb of





this plant is rich in glycosides, which, in small doses, can be used in the treatment of cardiac disorders. In many other areas of the Garden, clusters of *Pancretium parviflorum* (small-flowered pancratium) are scattered, whose unique seeds feature on the garden's new calendar and which received a lengthy article in [The Gardens News autumn 2016](#).

Other autumn bloomers are *Drimia undata/Urginea undulata* (undulate sea squill) and *Scilla hanburyi*. Both species grow in desert habitats and have selected for modest flowers that can be barely discerned against the background of their environment.



Buds of Sea squill. Photo: Yuval Sapir



Drimia undata. Photo: Yuval Sapir

Rare, thorny, and flowering plants

An extremely rare plant is currently flowering in the Botanic Garden. *Carlina racemosa* (western carline-thistle) is a thorny annual plant belonging to the Compositae family. Although the species is widespread in large areas of the western Mediterranean basin, in Israel, in the eastern part of the Mediterranean basin, it grows only at one site– the Achu Binyamina (meadow). However, the Achu Binyamina, which is a unique wetland habitat and home to many endangered species, is not an official (protected) nature reserve. Consequently, *Carlina racemose*, which is found only there, is under a persistent threat of extinction.



In summer 2018 Tal Levanony, the garden's curator, collected the seeds and germinated them, which is why this summer we could enjoy the clusters of yellow flowers that have given the plant its name.

This species will be planted in the Botanic Garden at the edges of the pond in the wetland area, which resembles its natural habitat. In this area *Althaea officinalis* (marsh-mallow) also grows, about which we wrote [last winter](#), and



which is another endangered plant (Red List) that came from the Achu Binyamina (meadow).

A convoluted story

During the summer we enjoyed the blooming of the *Convolvulus betonicifolius* (shaggy bindweed) in the flower beds by the Garden's entrance. *C. betonicifolius* is an herbaceous plant whose stems coil like ropes to assist it in climbing, and hence its name. Its flowers are white and impressive, up to 3-4 cm in length, and its petals fuse to form a funnel. *Convolvulus* flowers open in the



morning and close towards the evening, which is why some of the species are known as "morning glory". *C. dorycnium* (splendid bindweed) is another species of *Convolvulus* that was planted in the flower beds at the entrance to the Garden.



Two other species - *C. althaeoides* (falmate bindweed) and *C. secundus* (one-sided bindweed) will be planted in the Coastal Plain section of the garden in the near future. Most *Convolvulus* species constitute an important food source for small bees and other pollinators, as they flower during the summer season when few other plants are in bloom.

New Year, new calendar

As in every year, we are proud this year too to launch the Botanic Garden's calendar. This year's calendar focuses on seeds and dispersal units. The special characteristics of each seed or dispersal unit can be observed in the unique close-up photos that decorate the calendar, and which hint at the seeds' dispersal method.

The calendars can be purchased from the office of the Botanic Garden.



We would like to thank Or-Leyl Har-Edom for her great help in translating the news.

