THE STEINHARDT
museum of natural history
ISRAEL NATIONAL CENTER
FOR BIODIVERSITY STUDIES

Annual Report
2016/2017

The George S. Wise Faculty of Life Sciences
- School of Zoology
- School of Plant Sciences and Food Security

Sackler Faculty of Medicine
- Department of Anatomy and Anthropology
- The Maurice and Gabriela Goldschleger School of Dental Medicine

The Lester and Sally Entin Faculty of Humanities
- The Sonia and Marco Nadler Institute of Archeology
- Department of Archaeology and Ancient Near Eastern Cultures

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March 2018

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- Tatyana Novoselsky – Collections Manager (bugs)
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Israel Taxonomy Initiative

- National Project of the Higher Education and Research Systems; Ministries of Environmental Protection, Agriculture, Energy and Water, Science and Technology, and Health; KKL-JNF, Israel Nature and Parks Authority, Society for the Protection of Nature in Israel.

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- Prof. Alan Mathews – the Hebrew University of Jerusalem
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- Daniella Bar-Yosef, Coordinator, the Israel Taxonomy Initiative

PROGRESS AT THE STEINHARDT MUSEUM OF NATURAL HISTORY

Natural history collections are dynamic archives that record biodiversity. They grow through collecting activities and by incorporating private or institutional holdings. The collecting activities comprise focused expeditions as well as numerous field studies carried out by scientists and their graduate students. As the museum team grows and the number of laboratories involved in collections-based research increases, so does the rate of collecting. Moreover, the Israel Nature and Parks Authority rangers collect vertebrate carcasses for the museum. Collecting, incorporating other holdings, preserving and digitizing them, as well as managing the collections, data and the network of collectors and researchers, constitute an arduous task that falls upon the shoulders of the curators, and, even more so, on those of the collections managers, technical assistants, and taxidermists. We are fortunate to have a group of active, knowledgeable and dedicated technical staff members, who do their best, in nearly impossible environment, to preserve and expand this priceless record of Nature's legacy, and to promote scientific biodiversity research. Their work is highly specialized, their knowledge priceless; almost all have academic degrees, most have either a PhD or an MSc, and all create a robust backbone of the Steinhardt Museum at the Tel Aviv University.

A major challenge over the last few years has been the development of an Applied Policy-Relevant Research Division; developing projects and laboratories and absorbing others to meet the needs of science progress and those of various government ministries and agencies. Meeting this challenge has been exciting and invigorating, with many new museum staff members bringing significant expertise in applied conservation science. In coming years, we aim to strengthen the synergies between the applied research centers and institutes, and build up cooperation between them and the collections staff.

Our collections managers produced this report, and we are particularly grateful to the work of Revital Ben-David-Zaslow in compiling it and to Mike Mostovski and Daniella Bar-Yosef Mayer for their editorial input. Here a glimpse over the behind-the-scenes activities pertaining to the collections management is provided: collections news, collecting trips and expeditions, and new collections are reported here in a nutshell.

COLLECTIONS NEWS – A WORD FROM OUR COLLECTIONS MANAGERS

The staff members of the Steinhardt Museum of Natural History continue their activities to curate and promote the collections. We continue to collect and preserve new scientific material, rescue and incorporate important private and institutional collections, maintain the existing holdings, send scientific material and data abroad, and assist graduate students, academic courses, and educational activities.

During the academic year 2016/2017 we received and incorporated almost 23,500 new specimens of various taxonomic groups collected worldwide by our curators and staff, students, rangers from the Israel Nature and Parks Authority, and others.

The collections assembled by Prof. Yehuda Benayahu have been processed. They contain soft corals, sea anemones, sponges, tunicates, nudibranchs, and other invertebrates. As a routine procedure, tissue samples from most of the soft coral specimens were taken and preserved for molecular analysis. Almost 330 new specimens of soft corals were added this year.

We continue our fruitful cooperation with Tel Aviv University students collecting ample material, which is immediately digitized in order to facilitate easy transfer of specimens to the museum in the near future. Cooperation between students and the collections staff is excellent. We give students support in all fields including preservation, identification, labeling, and cataloguing. Students of Tamar Dayan have transferred a very large collection of mammals, amphibians, reptiles, and arthropods caught in pitfall traps to the museum. Collaboration with the laboratory of Yael Mandelik from the Faculty of Food and Agricultural Environmental Quality Sciences of the Hebrew University of Jerusalem, who studies wild bee pollination, has continued to be fostered. All the Hymenoptera specimens assembled during this research are properly labeled and assigned museum catalog numbers. At the end of the study the material will be incorporated into our collection. Students of Menachem Goren collected fish from the Mediterranean, and transferred their samples together with the collecting data to the museum.

ENTOMOLOGY DIVISION (INCLUDING ARACHNIDS)

Netta Dorchin, Amnon Freidberg, Inon Scharf, Gal Ribak, Moshe Guershon, Vladimir Chikatunov, Vasiliy Kravchenko, Sergei Zonstein, Mike Mostovski, Zoya Yefremova, Tanya Novoselsky, Wolf Kuslitzky, Armin Ionescu, Dany Simon, Tirza Stern, Leonid Friedman, Alex Shlagman, Malkie Spodek, Oz Rittner, Liz Morgulis, Miriam Kishinevsky, Avi Keysari, David Furth, Binyamin Shalmon, Amir Weinstein, Itzhak Nusbaum.

Curatorial, sorting and identification

General: The entomological collection is almost fully prepared for moving to the new museum building. The preparations included transfer of material to standard drawers and cabinets, preparation of individual drawer and cabinet identifiers and safeguards against damage during the move. These tasks were performed by all curators and collection managers.

Hemiptera:

- T. Novoselsky sorted and databased material of two important families, Belostomatidae and Oxycarenidae (849 and 106 specimens respectively). The material included some species new to science and/or to the Israeli fauna.

Hymenoptera:

- Ants: A. Ionescu re-identified some exotic species in the collection, partly revisied the *Cataglyphis niger* species group and began to work on the *Cataglyphis albicans* species group.
- Parasitic Hymenoptera: W. Kuslitzky handled the material of the subfamily Pimplinae (Ichneumonidae) collected in Israel. Specimens of Tersilochinae (Ichneumonidae) were sorted and sent for taxonomic treatment to Dr. A. Khalaim.

Arachnida:

- S. Zonstein described two new genera and four new species in the Palimanidae family, and previously unknown males of two Nemesiidae species.

Diptera:

- E. Morgulis began sorting all type specimens in our massive Diptera collection. Following the discovery of several new species, M. Mostovski has started working on a revision of the Israeli species of *Megaselia*. A manuscript with the description of a new South African genus with close affinities to New Zealandian *Kierania* is currently in preparation and a paper on the fauna of the *Atherigona* species of Mali has been submitted for publication.
- The gall-midge collection originating from work in N. Dorchin's lab is continuously databased and sorted. Dozens of specimens were slide-mounted in preparation for morphological study and hundreds of specimens were processed for molecular study as part of ongoing projects.

Professional work abroad

During a private visit to friends in Munich, Germany, L. Friedman dedicated a day for the Zoologische Staatssammlung München, where he met fellow coleopterists and studied the *Brachycerus* weevils. Another day was dedicated for collecting in the Bavarian Alps (under an official collecting permit). He was accompanied by local colleagues to different biotopes typical to Central Europe, but absent from Israel: mountain coniferous forest, moor, riverbank, and meadow. Overall, more than 500 specimens were collected, mainly weevils, leaf-beetles and longhorns, including the rare and beautiful Alpine longhorn beetle *Rosalia alpina*. Forty-five weevil species were collected, mainly representing common Central European species, some of which are new to the SMNH (the Steinhardt Museum of Natural History) collection. N. Dorchin spent two months in Cape Town, South Africa, where she kick-started a new joint project with local colleagues from the South African National Biodiversity institute, focusing on the taxonomy and phylogeny of gall midges (Cecidomyiidae) associated with plants of the family Izoaceae. The intensive fieldwork yielded more than 100 samples that were directly reared from identified plants – all of which probably represent undescribed species and genera. This material is currently processed for morphological and molecular study.

"Orphan collections" integration into SMNH

Two outstanding acquisitions have been made:

A collection of North and Central American Apionidae (Coleoptera: Curculionoidea) (ca. 300 specimens) from E. Riley, Texas A&M University, Department of Entomology, USA.

A collection of European (mainly German) and tropical (Africa, South Asia, Australia, South America) weevils (Coleoptera: Curculionoidea) (ca. 5,000 specimens), donated by German colleagues: M. Hiermeier (Munich), M. Langer (Niederwiesa), H. Muhle (Munich), G. Wagner (Hamburg) and H. Winkelmann (Berlin).

Identification Services

A total of 1149 specimens were identified by the museum staff, as follows: Ministry of Agriculture Plant Protection Services: 460 specimens (185 requests) TAU and other Academic institutions, Arthropod Eco-Monitoring Unit at the SMNH, National Parks Authority, Ramat HaNadiv and others: 689 specimens. As usual, our staff helped with identification of several hundred insect specimens during the Entomology Course.

Databasing

Approximately 17,300 new records were digitized during the reporting period, making a total of 282,635 items in the database. The Palmoni collection project: Avi Keisari added some 1500 new records from the Palmoni Collection to the Entomological collection database, mainly Lepidoptera belonging to the Noctuidae, Geometridae, Arctiidae, Nolidae, Thaumetopoeidae and Lymantriidae families, and Coleoptera from the Dasytidae, Cleridae, Scarabaeidae, Meloidae, Carabidae, and Corynetidae.

THE GENUS ANDRENA IN ISRAEL

Dr. Gideon Pisanty

The project aims to revise and update the knowledge of the Israeli members of the genus *Andrena*, and includes the following tasks:

1. Sorting and identification – ca. 1200 bee specimens collected this year by students of Yael Mandelik were sorted to genus/tribe and either identified to species level (517 specimens, mostly *Andrena* spp.) or sent for identification to other experts.
2. Collecting trips – 595 bee specimens were collected this year throughout the country, with localities situated in Judean Foothills, Upper Galilee, Western Negev, Jerusalem Mountains, and Mount Carmel. Obtained specimens were sorted to the genus/tribe level. Of these, 243 *Andrena* specimens were identified to species.
3. The bee species in the subgenus *Andrena (Poecilandrena)* from Israel and the Levant were revised, and five new species were described. Four species were recorded for the first time from the region, and 37 another species of *Andrena* from other subgenera were recorded from Israel for the first time. These findings are summarized in a new publication, "Taxonomic review of the subgenus *Andrena* (*Poecilandrena*) (Hymenoptera: Andrenidae) in Israel and the Levant" (Zootaxa, 2018).
4. *Andrena* specimens from the collection were loaned to the Canadian National Collection of Insects in Ottawa, Canada. The specimens, together with material from other collections around the world,

will be used for DNA extraction as part of a large project to uncover the worldwide phylogeny of the huge bee genus *Andrena* that comprises ca. 1500 spp.

5. The bee collection was prepared for moving to the new building. Material was transferred to custom drawers and sorted to family level.

TETRAPOD DIVISION

Shai Meiri, Roi Dor, Tamar Dayan, Yossi Yovel, Tamar Feldstein, Erez Maza, Daniel Berkowic, Amos Belmaker, Kessem Kazes, Igor Gavrilov, Stanislav (Stas) Volynchik, Chamutal Friedman, Yiftach Ramot, Arieh Landsman, Or Buchbut

Personnel

There have been few changes to the collection personnel. Igor and Stas are helped by Chamutal Friedman and Yiftach Ramot. Kessem, Amos and Erez carry on working in the collections, with some help from Daniel Berkowic, Or Buchbut and occasional volunteers (Arieh Landsman, Ori Mandel, Oliver Tallowin).

The re-structured responsibilities of the collection managers with Erez managing the herpetology collections, Kessem responsible for the mammal collection, and Amos taking over the bird collection seems to work well and will be retained.

Postdocs: two museum postdocs worked in the collections this year. Orr Comay was studying the taxonomy of house and Macedonian mice of the genus *Mus* and Yuval Itescu studies the taxonomy of vipers of the genus *Echis*.

Collection growth, absorption of other collections and active collecting

We are still incorporating the Beit Ussishkin collection of hundreds of birds, reptiles, amphibians and mammals into our holdings. There were other smaller donations this year, and a recent major one from the A. D. Gordon Museum in Kibbutz Dgania that we have recently brought over, and will start adding it to our collection soon.

The amphibian collection

Between November 30, 2016 and December 3, 2017 our amphibian collection grew by 84 specimens, from 2606 to 2690. Most represent *Pelobates syriacus* specimens that were brought by Eli Geffen, almost all of them tadpoles. Many specimens also represent captives of the breeding program that died in the experimental zoo. Members of six species—*Salamandra infraimmaculata* (1 specimen), *Bufotes viridis* (2), *Pelophylax bedriagae* (3), *Hyla savignyi* (6), *Ommatotriton vittatus* (9), and *P. syriacus* (65)—found their home in our collection this year.

The bird collection

Between November 30, 2016 and December 3, 2017 the bird collection grew by 397 specimens (from 20822 to 21219), about a third of last year's tally, or about half if Bet-Usishkin birds brought in last year are excluded. We actually got 557 bird specimens over the reporting period, but could only fully incorporate 397 because of a backlog created by insufficient manpower. The following discussion concerns birds entering the collection, rather than those queueing in our freezers.

Many of the 'new' birds are not really fresh aquisitions, but rather an effort of the collection manager, Dr. Amos Belmaker, to bring some order into our holdings. Thus, 183 birds on this list were either part of the previously uncatalogued 'teaching collection', or simply rested in storerooms with no numbers assigned to

them. Needless to say these are mostly specimens with no collection details like locality, dates etc. About 30 birds came from the Bet Ussishkin collection and 15 originated from the late Menachem Dor collection, alas the latter also undated. The rest are mostly (30 specimens) from private collectors. The commonest species of birds we received is the barn owl (*Tyto alba*, 15 specimens), Kestrel (*Falco tinnunculus*, 36 specimens), and white Pelican (*Pelecanus onocrotalus*, 9 specimens). All these always dominate lists. The 397 specimens represent 173 species; however, given the nature of much of the data (specimens found in the collection rather than entering it), drawing inferences would be premature. On the sunny side, we have recently received a fan-tailed raven (*Corvus rhipidurus*) from Ein Gedi. This is the first specimen of the common Judean Desert species to enter the museum since 1967. Another interesting recent addition, the black-throated loon (*Gavia arctica*), is an 'accidental' species that we had in the collection but the last specimen was received in 1970.

The mammal collection

The mammal collection grew by a mere 296 new specimens over the same period, from 15310 to 15606 specimens (about 167 fewer than in the previous year, which in itself had been 190 fewer specimens than 2015!). Our backlogs have extended further this year, for much time and huge effort was invested by the preparators in the preparation of displays in the new museum building, whereas Kessem worked only part-time in the collection. Our fruitful collaboration with Yoav Motro from the Ministry of Agriculture, who started bringing us mammalian pests that he is in charge of eradication, is continuing, but most of the received specimens are left in the freezer awaiting further treatment (336 mammals were registered in the corps register, but this excludes rodents brought by Yoav, only those reaching the preparation, thus the real backlog is much greater). The 296 new mammals received this year belong to 70 species, the commonest being, as in the last two years, mice (*Mus musculus* and *M. macedonicus*, 56 specimens together). Among the rest, the 'usual suspects' predominate: the common hedgehog (*Erinaceus concolor*, 35 specimens), golden jackals (*Canis aureus*, 25 specimens), mountain gazelles (*Gazella gazella*, 23 specimens), and wolves (*Canis lupus*, 18).

In the *bat collection*, in addition to extending the collection of Israeli bat species (with *Pipistrellus kuhlii* being the most often collected), this year we received several species that we had not had before. These include three species of African fruit bats (family Pteropodidae): four *Epomophorus wahlbergi* bats brought by the Yovel lab from South Africa and two *Micropteropus pusillus* from Mali One *Pteropus poliocephalus* was collected in the Zoo in Jerusalem. These new arrivals increased the number of fruit bat species in our possession from one to four. Another two species from Mali are also new to us: five bats *Chaerephon pumilus* (family Molossidae) and one *Lavia frons* (family Megadermatidae).

The reptile collection

The reptile collection has grown by a very impressive 792 specimens, from 17647 to 18439 specimens, over 40% increase compared to the last year's impressive tally. The list is dominated by two species, comprising 80% of all collected reptiles. Greek specimens (364) of the tree gecko *Mediodactylus kotschyi* were sent to us from the University of Athens, where they were kept as part of research by Yuval Itescu and Rachel Schwartz on the island biogeography of this species. The second most abundant species is the invasive gecko *Tarentola annularis*, with 255 specimens collected by Aviad Bar in Ein Gedi where the species is notoriously proliferous (Jamison et al. 2017). Fortunately, the Nature and Parks Authority decided to try and eradicate this gecko, and we hope the project will succeed. We have hundreds of these geckos still awaiting processing in our freezers, and thousands more are kept in the NPA freezers in Ein Gedi. Another abundant species is the common chameleon (*Chamaeleo chamaeleon*, 22 specimens). Altogether reptile specimens catalogued this year belong to 54 species (75 last year).

Overall the tetrapod collections have grown by some 1569 specimens, one of the largest figures in the history of the collections (though less than the nearly 2500 specimens of 2016). These newly obtained specimens are curated according to the best practices, with more detailed data and metadata, separately stored tissue samples, allocation of only one specimen per jar in the wet collections, etc. This staggering number is credited to the collection management staff, Erez, Kessem and Amos. This is also a remarkable achievement by the taxidermists, Igor and Stas, who managed to deliver this huge amount of high-quality material while busy with hectic preparation of specimens for the new displays. That said, we are working against increasing backlogs, especially in the mammal collection, but also in the reptile, amphibian and bird sections. Some of the specimens we registered this year had actually arrived as far ago as in 2014 and awaited treatment for three years.

Collection management: equipment, infrastructure, storage and curation

We are gradually incorporating the Beit Ussishkin and A.D. Gordon Museum collections into existing shelves and cabinets. The current storage space is no longer sufficient, and we are reviewing options to procure new collection cabinets (a batch of ten has been ordered). Thanks to Amos's initiative we have started using nylon 'sleeves' to store bird skins individually (the skin in the sleeve is placed alongside others in the drawer; Figure 1). We have also started using transparent plastic boxes for skull and skeletal material. Our first impressions are excellent (Figure 1). The boxes and sleeves protect specimens better and allow a researcher to pick only the necessary specimens rather than move a whole lot, thus minimizing potential damage. We have made no progress with introducing barcoding of jars and drawers, which would facilitate immediate identification and curation of specimens kept in cabinets and on shelves. We hope that the move to the new building will accelerate the process.

Figure 1: Left: a bird drawer in the old configuration, with exposed skins and skull in zip-lock bags. Rigth: a drawer with birds in nylon sleeves and skeletal material in plastic boxes (directed and photographed: Amos Belmaker)

Igor and Stas continue to improve the infrastructure of the preparation area, following the changes to the structure of buildings in the Zoological Garden itself. We are anxiously awaiting the move of the databases onto a new platform, which will enable individual-based records to be freely available to the public over Internet.

According to our records, 27 people (academics and artists, from Israel and the UK) visited the collections last year. At least nine teaching courses (six TAU courses) used collections materials. We have sent specimens, DNA samples and data to 21 scientists (and artists) in Israel, Greece, Slovakia, Thailand, Brazil, Italy, and the USA.

THE FEATHER IDENTIFICATION LAB

Avigail Ben-Dov Segal, Roi Dor and Tamar Feldstein

Military and civilian air traffic has increased dramatically over the last decade in Israel. This heavy traffic shares skies with a half billion migratory birds that pass through Israel twice a year (in addition to resident birds), which creates a tremendous risk of bird strikes leading to substantial material damage and even loss of human lives. Identifying the risks is an important step in order to prevent bird strikes and improve flight safety. Therefore, it is essential to identify the bird species, which are involved in accidents.

Since 2011 the Feather Identification Lab is collaborating with the Israeli Air Force, the Israel Airports Authority, the Civil Aviation Authority and the Israel Nature and Parks Authority to identify feather remains. In 2013 an official contracts were signed between the Feather Identification Lab (TAU) and the Israeli Air Force, the Israel Airports Authority and the Civil Aviation Authority to provide all feather identification for bird strikes in Israel. The lab provides over 100 identifications annually. In addition, we provide feather identification for the Israel Nature and Parks Authority and help detect poaching of wild birds and identify bird species collected in new surveys on the effects of wind turbines and electric lines on wildlife.

The Lab's main goal is to identify feather remains (mainly from air strikes) to the lowest possible taxonomic level. The feathers are identified using various techniques including histological slides for microscopic identification as well as morphological identification of the feathers. We have a comprehensive comparative collection of histological slides of many Palearctic species that is used for microscopic identification, as well as a large comparative feather collection that we continue to expand. Our presence at The Steinhardt Museum of Natural History enables us to take advantage of the largest regional collection of bird specimens (>18,000), which is an invaluable resource for identifying feathers from different species of birds.

The molecular lab at the museum (headed by Dr. Tamar Feldstein) now routinely provides genetic identifications of bird remains. This additional information compliments our microscopic identification and morphological identification. It is particularly important when damage was caused to an aircraft and in cases where the remains do not allow species level microscopic identification.

So far, in 2017, the lab provided identifications for 134 bird strike cases and 352 cases for the Israel Nature and Parks Authority. These identifications included 31 genetic analyses.

MOLECULAR LABORATORY

Tamar Feldstein

The molecular laboratory of The Steinhardt Museum of Natural History at the Tel Aviv University offers identification of museum samples when morphological identification is in doubt. The molecular data add value to unique samples and facilitate curation of the museum collections. This year we published the discovery of a new alien species of Polychaeta found along the Israeli Mediterranean coast. In addition, a multi-annual project for the identification of the Israeli sponge fauna, supported by the Israel Taxonomy Initiative (ITI) was summarized in a paper that was accepted for publication. During 2017 we analyzed DNA extracted from fungi, sponges, polychaetes, crustaceans, birds, mice, snakes and lizards.

Altogether, the DNA from 158 tissue samples was extracted and processed during 2017, as follows:

- Identification of reptiles (snakes and lizards) for research conducted at the School of Zoology, Tel-Aviv University.
- Identification of mice for research conducted at the School of Zoology, Tel-Aviv University.
- Identification of birds collided with airplanes (birdstrike) as part of an ongoing service we provide to the Israeli Air Force and the Israel Airports Authority.
- Miscellaneous identifications for researches at the Department of Zoology, TAU, and for the Israel Nature and Parks Authority (INPA).

The Molecular Systematic Collection consists of frozen or alcohol-preserved tissues of vertebrates and invertebrates. We encourage its use by the international, non-profit, research community. This year, tissue samples from snakes were sent to Daniel Jablonski from Slovakia and to Panagiotis Kornilios from Greece. Fox tissue was loaned to Stephan Prost from Berkeley, USA. During 2017, 514 tissue samples from 239 mammals and 609 tissue samples from 212 birds and 282 tissue samples from 195 reptiles were added to the museum tissue collection.

MEDITERRANEAN FISHES

Jonathan (Yoni) Belmaker

Nowhere is the native biota faced with changes that are more rapid than in the Eastern Mediterranean, where the continual influx of invasive Red Sea species, warming water temperature, overfishing and pollution are transforming fish diversity. The Mediterranean fish collection provides a globally unique resource that is used to identify how these immense changes influence fish diversity, biogeography and, more generally, marine ecosystem services and function. Such understanding can be used to identify the consequences of these major changes to the integrity of the marine ecosystem and, perhaps more importantly, to mitigate future adverse influences of human activity.

Research:

- We finished taking detailed measurements of Mediterranean and Red Sea fish ecomorphological traits from museum specimens. This year we began to analyze this data to test for biotic and abiotic constraints on traits diversity associated with fish invasion.
- We are developing models using (among other data sources) the collection's georeferenced data to identify the geographical and environmental constraints on the distribution of invasive species (Givan et al. 2017).
- We continued fish sampling based on trawl catch as part of Itai van Rijn's and Hezi Buba's PhD projects. Sampled fish are being used to quantify how mortality and growth differ between invasive and native species based on otolith measurements. Representative samples are deposited in the collections.
- We continued fish sampling based on recreational fishermen catch as part of Ori Frid's PhD project. The goal of this study is to understand temporal dynamics of catch and by-catch. Representatives of unique species are deposited in the collections.
- We led an intensive fish survey effort in collaboration with the Israel Nature and Parks Authority along the Mediterranean coast. The goal is to establish an ecological baseline that can be used to assess the effectiveness of protection efforts such as the establishment of Marine Protected Areas and increased reinforcement. Surveys were conducted in the spring and fall of 2017 and included all lab members, as well as other graduate students affiliated with the museum (e.g. Nir Stren, Bat-Sheva Rotman).

THE ASCIDIACEA COLLECTION

Noa Shenkar

Ascidians (Phylum Chordata, Class Ascidiacea), or sea squirts, consitute the largest and most diverse class of the sub-phylum Tunicata (also known as Urochordata). They comprise approximately 3000 described species found in all marine habitats from shallow water to the deep sea. The class Ascidiacea presents fundamental opportunities for research in the fields of development, evolution, ecology, regenerative biology, natural products and more. During 2016–2017 the Ascidiacea collection at The Steinhardt Museum of Natural History was significantly advanced with the addition of samples from both the Mediterranean and Red Sea coasts of Israel. This year the collection was especially active with student research, as the number of graduate students involved in the collection, identification and vouchering specimens increased significantly. Through efforts of Gal Vered and Hila Dror, two MSc student working along the Mediterranean coasts of Israel we were able to continuously monitor the spread of non-indigenous species. During 2017 we conducted numerous field trips along the Mediterranean coast of Israel, including both natural and disturbed habitats. The increased sampling effort resulted in over 50 new specimens in the collection, and included the study on the influence of sewage spills events on the establishment of non-indigenous ascidians (Gewing et al. 2017, Marine Environmental Research). In addition, Dr. Zafrir Kuplik has joined our group with the support of VATAT. His active sampling and monitoring of the Mediterrranean coast will certainly advance the collection in the upcoming year, together with implementation of new proteomic tools in the study of ascidians as biological indicators of marine environments. We continued our activity as professional taxonomic identifiers of ascidians to several researchers and organizations in Israel and abroad. International collaborations included material exchange with Prof. Aibin Zahn, China, Prof. Rosana Moreria de Rocha from the Universidade Federal do Paraná, Curitiba, Brazil, Dr. Shane T. Ahyong from the Australian Museum, Sydney, and active service of Dr. Noa Shenkar on the Editorial Board of the European Aliens Species Information System (EASIN) and as an Editor of the Ascidiacea World Database. Our research has been supported by the Israel Scientific Foundation, Regular research program (PI: Dr. N. Shenkar) "Ascidians (*Chordata*, *Ascidiacea*) as bio-indicators of the marine environment – from ecological, physiological, and cellular perspectives" 250,000 NIS per year (2015–2019).

PORIFERA COLLECTION

Sigal Shefer

Collection and field survey of the Porifera community along the Mediterranean of Israel, and other locations:

This year 239 specimens were added to the collection. Most of them were collected during four excursions to the mesophotic sponge grounds at 80–100 m depth, off Herzliya, Rosh Karmel, Atlit and the mesophotic reef in Eilat. These specimens were collected as part of studies conducted at Prof. Ilan's lab.

The rest of the specimens originated from various sources such as BioBlitz and CSA Ocean Sciences Inc.

Taxonomic identification service:

Five samples were identified for CSA Ocean Sciences Inc. (Elad Mills), 25 were accepted for identification in May 2017 and 63 samples in October 2017 as part of the BioBlitz.

Museum sample loans:

Three specimens were used (PO25801 – *Chondrilla*, PO25923 – *Aplysina cavernicola*, PO25683 – *Aplysina* sp.). Sub samples were taken for chitin analysis by Nico Bruyniks, undergraduate student from Micha Ilan's Lab. Sixteen specimens were used by Liron Goren, a post doctorate student from Prof. Ilan's lab. One subsample of *Thymosiopsis conglomerance* (PO25914) was given to Prof. Paco Cardenas from the Uppsala University, Sweden.

Collections organization:

The sponge collection is undergoing a massive archiving process. This process is enabled thanks to the work done by Kessem Kazes who joined me in the last few months. We are updating scientific names at various taxonomic levels, adding new specimens to the collection, printing new labels, replacing fixative solutions and arranging the samples on the shelves according to their systematic affiliation.

Courses and Training:

I participated in the 10th World Sponge Conference, 25–30.6.2017, NUI Galway, Irland. Two posters were presented: (1) How to protect a mesophotic sponge ground – a case study (Shefer S., Idan T., Feldstein T., Yahel R., Huchon D., Ilan M.) and (2) Oases of diversity: East-Mediterranean mesophotic sponge ground (Idan T., Shefer S., Feldstein T., Yahel R., Huchon D., Ilan M.).

I visited (4–15.9.2017) Prof. Thierry Perez and Prof. Jean Vacelet with Tal Idan at the Institut Méditerranéen de Biodiversité et d'Ecologie marine et continentale Marseille Université, Station Marine d'Endou, France. During this visit, we identified sponges collected along the Mediterranean coast of Israel and compared them with sponges collected along the coast of Lebanon. This important visit was guided by two leading sponge taxonomists, focusing on Mediterranean sponge species. Following this visit we hope to foster collaboration with Prof. T. Perez.

BRYOZOA COLLECTION

Noga Sokolover

Collection and field survey of the Bryozoa community along the Mediterranean of Israel:

Ten specimens were collected during excursions to the mesophotic sponge ground located at depth of 100 m, off Herzliya and Rosh Carmel. This was done as part of studies conducted at Prof. Ilan's lab. The new collection has been inserted into the digital database.

Taxonomic identification service:

- Two samples were identified for CSA Ocean Sciences Inc.
- Four samples were identified for Emily Higgins, graduate student (MSc candidate), Dalhousie University, Canada.
- Seven samples were identified as part of the fall (June 2017) BioBlitz and three of the spring (October 2017) BioBlitz, three more are still being identified.

Courses and Training:

I participated in the 14th Larwood symposium 2017, Vienna. Poster presentation entitled: The 'Pearls' of *Schizoporella errata*.

THE CRUSTACEAN COLLECTION

Ya'arit Levitt

The subphylum Crustacea (phylum: Arthropoda) is the only large group of arthropods that is primarily aquatic, with more than 50,000 described species. Most crustaceans inhabit marine, freshwater, and terrestrial environments all over the world, and some species may even be found in extreme—in terms of temperature, pressure, and salinity—environmental conditions. Crustaceans have a significant economic and ecological importance, and they are considered as an important food source to human and marine animals. Since the beginning of my PhD studies on October 2013 on the infraorder Caridea, I have invested much effort in collecting specimens along the coasts of Israel, both Mediterranean and Red Sea and in reorganization of this group. During October 2016 – September 2017, approximately 345 caridean specimens were added to the collection from the Mediterranean and Red Sea coasts of Israel, and from the fresh water bodies of Israel.

More than 650 samples of Crustacea were computerized, including approximately 130 new samples added to the collection during the last year. Some of the new material had been brought by Prof. Bella S. Galil, our associate curator of invertebrates, Prof. Yair Achituv from the Marine Biology department, Bar-Ilan University, and students from the School of Zoology, The George S. Wise Faculty of Life Sciences, TAU.

The entire Crustacea collection has been reorganized, and unidentified specimens are being taxonomically determined.

ALGAE COLLECTION

Razy Hoffman

Aims achieved (December 2016–present):

- Algal surveys along the Mediterranean coast of Israel and the gulf of Eilat continued. Since the beginning of the present postdoctoral study, the national algal and seagrasses herbarium at the TAU was upgraded with the addition of over 9,000 samples distributed in ca. 2910 wet (in alcohol) and dry herbarium specimens! Surveys revealed dozens of alien and indigenous seaweeds that have never been reported from the Levant shore of Israel before. Most of the new alien species, are first records from the Mediterranean Sea. Taxonomical and molecular studies revealed several species new to science from the Levant Mediterranean shore of Israel.
- Two papers presenting the results of ecological, biogeographical, taxonomical, molecular and morphological studies conducted in 2017 were accepted for publication or under review.
- Seaweeds that were collected during ongoing BioBlitz surveys, conducted by Israel Nature and Parks Authority in spring/summer 2017, were identified and listed in order to be published in their reports.
- As a recognized expert of Algal taxonomy and ecology, I reviewed one manuscript for a peer reviewed journal, *Botanica Marina*, in 2017.

Tasks in progress and plans for 2017-2018:

- Paper representing a new red algal species, *Calliblepharis rammediorum*, from the Israeli Mediterranean Sea, is at the final stage of preparation and will be submitted to the peer reviewed journal *Cryptogamie Algologie*.

- A paper regarding the ecological significance of the first occurrence of the seagrass *Halophila stipulacea* on the southern shores of Israel is in preparation and to be submitted to *Phycologia*.
- A paper representing the genus *Padina* from the Levant shore of Israel including description of a new species, *Padina israelica*, is in preparation. This paper (Hoffman et al.) represents five species of the genus recognized by morphological and molecular tools. This article is expected to be submitted for publication during 2018.
- First paper (chapter published at the beginning of this Post-Doctoral study in the scientific book *The Mediterranean Sea; Its History and Present Challenges* (published by Springer in 2014) showed that there are ca. 20 alien seaweeds species in the Mediterranean shore of Israel. However, surveys conducted in 2013–17 revealed that there are nearly 70 alien algal species along our shore with many records of new alien species from the Mediterranean Sea. Therefore, two new review manuscripts representing all the alien species found, so far, are in preparation. The first review deals with the alien species of the Chlorophyta, Phaeophyta and Angiospermae. The second review reports on non-indigenous species of the Rhodophyta, with more than 40 alien seaweeds found so far! These reviews are expected to be submitted for publication during 2018. The articles regarding *Padina* sp., *Codium pulvinatum*, *Calliblepharis rammediorum* (noted above) and these two reviews are the masterpieces of this postdoctoral study.
- Quantitative study of the algal drift, started in 2005 at the Haifa Bay, and continued during this postdoctoral study, along the northern shores of Israel, shows that the natural local marine flora was depressed by alien seaweeds invaders, and also suggests shifts in the domination of alien seaweeds along the northern shore of Israel. This research studies the domination of alien seaweeds and shows, now, that 4 invasive alien species replaced each other during a period of no more than 12 years. This study will continue in 2018.
- Algal and seagrasses surveys as well as the maintenance of the collection of will continue until the end of the present postdoctoral study.
- A new major project focusing on the national algal collections of Israel will start in 2018. The purpose of the project is to publish two checklists of all species found and collected, so far, from the Levant Mediterranean Sea and the Israeli and Sinai Red Sea shores. Considering that there are thousands of specimens, this is a rather long term project that may take more than one year.

TERRESTRIAL, FRESHWATER AND MARINE FREE-LIVING NEMATODES

Dr. Stanislav Pen-Mouratov

Major organizational and research goals and objectives and their solutions.

The collection of terrestrial, freshwater and marine free-living nematodes is a fairly new, two-year old unit at the Steinhardt Museum of Natural History. Since November 2015, at the beginning of my scientific activity in Tel-Aviv University as a Senior Lecturer and a Curator of Free-Living Nematodes, my first and most difficult problem was, and up to this day is, the organization of the elementary basic equipment.

Study goals. There are as least five main goals in the study of free-living nematodes in Israel:

- To study the species diversity, abundance, and distribution of free-living nematodes in terrestrial ecosystems;
- To study the species diversity, abundance, and distribution of free-living nematodes in freshwater environments;

- To study the species diversity, abundance, and distribution of free-living nematodes in marine environments;
- To study the anthropogenic impact on the free-living nematodes in terrestrial, freshwater and marine ecosystems;
- Prepare monographs on the ecologicy, abundance, diversity and taxonomy of nematode species inhabiting the terrestrial, freshwater and marine environments of Israel.

Research projects. Four research projects that have been carried out by me during the two years:

- Impact of the Israeli avifauna on soil microbial activity, abundance and distribution of soil free-living nematode communities. The soil samples were taken in two different seasons of the year and kept in cold storage before analysis. The nematodes from each sample were extracted, counted and identified according to order, family, and genus using a compound microscope. Fixed samples were prepared for long term storage. The obtained data of soil properties, soil microorganisms and nematodes were used to write a scientific paper (see below).
- The effect of *Eucalyptus camaldulensis* and *Ceratonia siliqua* on soil free-living nematode communities in shifting sands of the coastal plains of Israel during the wet period. The nematodes from each sample were collected and identified according to order, family, and genus using a compound microscope. *Pre-conclusion*: The effect of the trees on soil biota is unclear and it is required to expand the study taking into account the seasonal effect.
- Seasonal effect of *Eucalyptus camaldulensis* and *Ceratonia siliqua* on soil biota abundance and distribution in shifting sands of the coastal plains of Israel. The soil samples were collected and are being processed.
- Marine nematodes in shallow water coastal sediments of the Mediterranean Sea, Israel. Sediment samples were collected last year. Many methods were applied before the most suitable methods for extracting, fixing, storage and mounting nematodes were chosen for our purposes. Fixed samples were prepared for long term storage.

International collaborations. During the year, I continued active collaboration with scientists of different scientific organizations from different countries who study free-living nematodes, and some of them were very helpful in many ways. I visited the Department of Zoology of the Swedish Museum of Natural History to study new methods of identification of nematodes, with particular focus on taxonomically challenging genera, including marine nematodes. A significant part of the visit was devoted to the study of different methods of preparation of scientific illustrations (drawings and photomicrographs) of nematodes.

Cooperation with students and staff members of the Tel-Aviv University and The Steinhardt Museum of Natural History, Israel National Center for Biodiversity Studies. Students of Prof. Tamar Dayan's lab provided assistance in many ways: Hila Shamoon, a PhD student and the Lab Coordinator, put forth great assistance in ordering all necessary lab equipment; Orr Comay, a PhD student, and Michal Zaitzove-Raz, an MSc student, provided information and help with soil sampling during the Bird-Nematodes project; Aviv Avisar, a PhD student, was helpful and provided guidance during sampling days and graciously shared information regarding the *Eucalyptus* project in the study area.

BIO-HISTORY AND EVOLUTIONARY MEDICINE LABORATORY

Hila May

The Laboratory is an inter-disciplinary unit focusing on two major topics: evolutionary history of anatomical systems and their impact on the current populations' health, and reconstruction of the ancient populations' daily life, based on their skeletal remains, with an emphasis on the interaction between genetic and socio-cultural factors.

During 2017, several research projects, based on the anthropological collection, were carried out in my laboratory. In addition, collaborations with laboratories from foreign universities, based on the anthropological collection, continued/commenced. Several original papers and conference abstracts were published.

Research activity based on the anthropological collection:

During 2017 the following projects based on our anthropological collection were carried out in my laboratory:

- Inflammatory ear disease (otitis media, OM) in the Neolithic: From cave dwelling to constructed houses. After developing a reliable method for identifying pathological processes associated with OM in skeletal remains (middle ear and ossicles), we studied the prevalence of OM in prehistoric and historic populations during the Holocene. Consequently, we revealed how lifestyle, type of habitation, and settlement density affected the prevalence of this pathology in past populations (e.g., Natufian hunter-gatherers, Neolithic early farmers and Chalcolithic farmers). This study was carried out by Dr. Fluernova, a postdoctoral fellow, from March 2015 to March 2017 (in her first half year she received 50% scholarship from VATAT) and Efrat Gilat, an MD student.
- Changes in the proximal femora shape following changes in Physical burden and lower limb bone morphology at the origins of agriculture in the Levant. The aim of this study is to reveal the influence of the transition from hunting-gathering to farming economics on the physical burden and daily life activities of the people that were part of the transition. This quest is examined from various aspects (e.g. biomechanical analysis, 3D curvature analysis and 3D shape analysis of the femur), by Hadas Levine, an MSc student and Victoria Roul, a PhD candidate.
- Subsistence transition and the mandibular morphology. The aim of this study is to examine differences in the diet consistency and food preparation techniques in pre- and post-agricultural revolution populations in the southern Levant based on the mandibular characteristics and 3D shape analysis. This study is carried out by Ariel Pokhojaev.

Collaborations based on the anthropological collection:

Several projects based on the anthropological collections were carried out in collaboration with laboratories from foreign universities:

- The origin of the Chalcolithic population from the southern Levant in collaboration with Prof. David Reich, Department of Genetics, Harvard Medical School, USA.
- The origin of the Natufian and Neolithic populations from the southern Levant, in collaboration with Dr. Johannes Krause, Max Planck Institute for the Science of Human History, Jena, Germany.
- The effect of the diet on the mandibular morphology using finite element analysis in collaboration with Dr. Ekaterina Stansfield and Prof. Paul O'Higgins, Centre for Anatomical and Human Sciences, Department of Archaeology and Hull York Medical School, University of York, York, UK.

ACTIVITIES RELATED TO THE BOTANICAL COLLECTION

Dafna Langgut

All the research at the Laboratory of Archaeobotany and Ancient Environments (Institute of Archaeology, TAU) is based on botanical collections. Different holdings available in the Lab focus mainly on the Israeli flora and include the following:

- Pollen and Spores Collection (a reference collection)
- Wood Collection (a reference collection)
- Charcoal Collection (a reference collection)
- Archaeobotanical collection (items from archaeological excavations)

Activities related to the reference collections during the past year:

- We established a new reference collection of thin sections (<30 microns) of wood structure of all tree species native to Israel.
- We collected new samples for all of our references collections (pollen, wood and charcoals), mainly from Tel Aviv Botanical Gardens (with the collaboration of Dr. Y. Sapir).
- We hosted Tiphanie Chica-Lefort, a PhD student from the Sorbonne University, Paris, who used our wood and charcoal reference collections for her study which is related to the ancient flora of Israel.
- Identification of botanical remains for the Israel Antiquities Authority:
- Charcoal assemblages and wooden implements from the Byzantine Street, Givati Parking Lot, Area D3, The Stepped Street (all City of David, Jerusalem), Nevatim and Yotvata.
- Pollen identification: Ramat Beit Shemesh and Yeruham.
- Identification of parasite remains for the Israel Antiquity Authority:
- The Stepped Street and Givati Parking Lot (both City of David, Jerusalem).
- Participation in archaeological excavations in order to collect samples for research purposes:
- Timna – Southern Arava (February, 2017); Nitzana (February, 2017); Masada (February, 2017); Herodium (May, 2017); Ashdod-Yam (July, 2017), Kiryat Yearim (August, 2017), Jordan River Dureijat (September, 2017).
- We studied in detail and documented the "Colt Collection" (wooden implements from Shivta). The collection is currently hosted in three different locations: Israel Antiquities Authority, Hecht Museum and Rockefeller Museum.

ANCIENT DNA

Meirav Meiri

This year was very significant for us. Joint efforts of Professors Tamar Dayan, Israel Finkelstein, Dorothee Huchon and mine were very fruitful. We received a grant from Yad Hanadiv to establish an ancient DNA laboratory in the Steinhardt Museum of Natural History. The laboratory will focus on animals and plants and will be open to all scientists in Israel. Consequently, since we received the grant, I was busy with planning the lab and ordering equipment.

At the same time, I also concentrated on two main projects:

Mobility and societal change in the eastern Mediterranean in the Late Bronze and Early Iron Ages

In collaboration with Ludwig-Maximilians-University Munich, Germany, and University of Heidelberg, Germany, I focused on cattle and pigs from Tiryns, Greece, in order to increase the sampling size. I sampled 20 and 36 ancient pig and cattle bones and teeth respectively, from the Helladic period (ca. 3200–1050 BCE). I extracted DNA and amplified small fragments of the mtDNA. I found that the collapse of the Mycenaean palaces around 1200 BCE did not lead to a change in the genetic patterns as we suspected. The genetic profiles of pigs and cattle in Tiryns before and after the collapse were similar.

Resilience and collapse of early Christian development of the Negev Desert

As part of a collaboration with University of Haifa, INRA-CIRAD-Montpellier, France, and University of Copenhagen, Denmark, I collected a few modern local vine cultivars and wild forms to build a reference collection for the ancient samples. At the moment I am trying different DNA extraction methods. The DNA samples will be then sent the to France for single-nucleotide polymorphism analyses. I have also extracted six ancient grape seeds from Ovdat and amplified their DNA using Next-generation sequencing in the ancient DNA Centre in Copenhagen. At the moment, I am analyzing the results. This year I also organized a workshop together with Dr. Reuven Yeshurun at University of Haifa. The workshop title: "Present and Future Zooarchaeological Research in China and Israel".

LABORATORY OF ARCHAEOZOOLOGY

Lidar Sapir-Hen

During the last year I was engaged in research and published papers in scientific journals, supervised MA and PhD students and taught courses, participated in international conferences and in archaeological excavations:

- Advising two MA students and one PhD student (who also did her MA with me). One of the MA students submitted her thesis. The students' work is based on faunal assemblages from archaeological sites, and relies on the mammals comparative collections of the museum.
- Teaching at the TAU: Animal remains in archaeology, domestication of animals, MA seminar in Archaeological Science, practical workshop in archaeozoology, Archaeology of dogs.
- Teaching includes frontal lectures and a practical workshop based on recent mammal collections of the museum.
- Presenting at two international conferences (Vancouver, Paris) and one local event (Tel Aviv).
- Active participation in archaeological excavations at Timna and Masada (February 2017) and Kiriat Yearim (August 2016). This included advising site directors on finds retrieval methods, and lectures to students of the field school using comparative collections.
- Carrying out research on archaeological assemblages of the TAU and Israel Antiquities Authority, relying on the mammalian and avian collections: EPPNB Tzomet Ahihud, Hellenistic Givaty, Middle and Late Bronze Megiddo, Late Bronze and Iron Age Timna, Late Bronze Azekah, Iron Age Ophel.

ARCHAEOMALACOLOGY

Daniella E. Bar-Yosef Mayer

In March 2016 I organized, in collaboration with Marjolein Bosch from Cambridge University, a workshop entitled "Humans' earliest personal ornaments: symbolism, production and distribution". The workshop took place at The Steinhardt Museum of Natural History, Tel Aviv University. It included a wide array of topics pertaining to our current knowledge and understanding of the role of shell beads and other personal ornaments in prehistoric societies. Twenty-four scholars from around the world participated, representing twenty academic institutions, and it was attended by about thirty scholars from Israel. Two days of presentations were followed by a field trip to the Mt. Carmel Caves, Manot Cave in the Glillee and Akko. Publication of the proceedings is underway as a special issue of the on-line journal *PaleoAnthropology*. The workshop was funded and supported by the Wenner Gren Foundation, Tel Aviv University, Ben Gurion University, Cambridge University, the Marie Curie EU fellowship program, and the American School of Prehistoric Research at Harvard University.

The past academic year was dedicated to several activities that relied on research in the malacological collections, based on the SMNH collections, Tel Aviv University. Archaeo-malacological shell assemblages of sites in Israel continued, with special emphasis on Palaeolithic sites: The shell beads from Qafzeh Cave are studied for use-wear marks in collaboration with Dr. Iris Groman-Yaroslavsky from University of Haifa. A single shell from the neandertal bearing site of Ein Qashish is under study. Shells from Manot Cave are being analyzed. The shells from Abu Noshra I in southern Sinai have been studied. I joined a new project, Jordan River Dureijat, directed by Gonen Sharon from Tel Hai College. This is a shell midden on the bank of the Paleo-lake Hula dating to the end of the Pleistocene, ca. 20,000–11,000 years ago. A re-study of the shells from Natufian Eynan has been initiated. The shell assemblage of a newly discovered Neolithic site in Nesher Ramle was studied and prepared for publication by Heeli Shechter under my supervision. The study of shells from the Bronze Age sites of Tel Yaqush and Tel Shera continues.

Additional research activities include the study of beads from the Late Bronze/Early Iron Age site of Timna, and the Pottery Neolithic site of Ein el Jarba.

THE PALEONTOLOGICAL COLLECTION

Daniella E. Bar-Yosef Mayer

Catloguing of the paleontological collections at the museum continues. The largest component of the collection is the private collection donated by the late Professor Heinz Bytinsky-Salz, formerly a professor of entomology in the Department of Zoology, Tel Aviv University, who collected fossils as a hobby.

The collection is identified and tagged, and each item is registered in the digital catalogue and given a catalogue number. As each item is being inserted into the catalogue, we revise the taxonomic identification for updated scientific names, however, the identification itself is not being verified but will have to await research by specialists. The main sources for the taxonomic updates are the internet sites "The Paleobiology Database" and its sub-site "Fossilworks" as well as online catalogues of other museums such as the Musée National d'Histoire Naturelle in Paris and relevant scientific publications. In addition, we verify the geographic names of collection sites.

The intensive cataloguing is performed by Dr. Olga Orlov-Labkovsky, who works on foraminifera and catalogues them in the collections database, and Daniella Bar-Yosef Mayer, who deals with molluscs. Additional groups will be catalogued at a later date.

Dr. Orlov-Labkovsky describes and prepares the foraminifera into thin-sections or slides. The collection consists primarily of specimens from the the Carboniferous system (Upper Paleozoic) of Central and South Tien-Shan (Central Asia: Uzbekistan, Kyrgyzstan, Tajikistan and Kazakhstan). At present, those are represented by five families (Profusulinidae, Aljutovellidae, Fusulinidae, Hemifusulinidae, Fusulinellidae) of the order Fusulinida. In addition, the slide collection the family Triticitidae (order Schwagerinida, 8 genera, over 120 species and 23 thin-sections of holotypes) is being catalogued as well.

To date, we catalogued 3000 records of molluscs representing approximately 8300 individuals. Those belong to at least 864 genera and approximately 2000 species. While the majority of specimens were collected around the world, and mostly in Europe, 767 records (about 25%) are from Israel. Chronologically, our world-wide palaeontological collections consist of organisms belonging to as early as the Ordovician, some 450 million years ago, and from Israel as old as the Triassic, about 250 million years ago. The most recent fossils date to the Pleistocene, i.e. last two million years.

In addition to the Bytinsky-Salz collection, there are additional fossil collections awaiting cataloguing: Nathan Shalem, Yael Khalifa, Vitsker, Bet Ussishkin, Maabarot, and Bet Gordon, the last three were donated to the museum over the past year.

FOSSIL FORAMINEFERA

Olga Orlov-Labkovsky

During the academic year 2016/17, I continued to carry out research in the fields of taxonomy, systematics, nomenclature, paleobiogeography and paleoecology of the Upper Paleozoic foraminifera.

In cooperation with Dr. Dorit Korngreen of the Geological Survey of Israel (Jerusalem), I continued to work on the project "Foraminifers of the Permian–Triassic (P/T) transition in the Coastal Plain of Israel". Our current research is focused on "Patterns of Foraminifera extirpation and reconstruction during the Paleozoic-Mesozoic transition in tropical mixed settings". Preliminary results were presented at the 5th IGCP 630 International conference and field workshop, 8–14 October, 2017 Yerevan, Armenia:

- "The estuarine environments: new insights from combining isotopic, sedimentary and biostratigraphic constrains on the tropical Middle–Late Permian to Early Triassic marginal marine strip of the Gondwana supercontinent"
- "Spatial variation in foraminifera distribution and occurrence in response to changes in the sedimentary environments and global changes; the tropical Middle–Late Permian to Early Triassic marginal marine strip of the Gondwana supercontinent".

I continue to participate in the work of the International Bashkirian–Moscovian Task Group, International Subcommission on Carboniferous Stratigraphy, and reported jointly with the T. Isakova, A. Dzhenchuraeva at the Kazanian Golovkinsky Stratigraphic Meeting – 2017 (Upper Palaeozoic Earth systems: high-precision biostratigraphy, geochronology and petroleum resources) on the "Fusulinides from Bashkirian/ Moscovian transition in the Carboniferous of Eurasia: phylogeny, distribution, stratigraphical potential".

During the past academic year I continued to work on:

1. The preparation of the fossil material in the Paleontological collection;

2. The organization of a database for microfossils;

3. The description of taxa and the detailed documentation of taxonomic lineages.

I worked on the collections of foraminifera (thin-sections or slides) of the Carboniferous (Upper Paleozoic) of the Central and South Tien-Shan (Central Asia: Uzbekistan, Kyrgyzstan, Tajikistan and Kazakhstan). At present, representatives of five families (Profusulinidae Solovieva, 1996; Aljutovellidae Solovieva, 1996; Fusulinidae Moeller, 1878; Hemifusulinidae Putrja, 1956; Fusulinellidae Staff & Wedekind, 1910) of the order Fusulinida Fursenko, 1958, are already entered in the database and I work with other families. In addition, I prepared the slide collection the family Triticitidae Davydov, 1986 (order Schwagerinida), including 8 genera, more than 120 species and 23 thin-sections of holotypes. Some of the above Foraminifera are entered into the database or are in a progress of being catalogued.

The Paleontological library

The following books were donated to the Paleontological library by Olga Orlov-Labkovsky:

- Wong, Th.E. (Ed.). 2007. Proceedings of the XVth International Congress on Carboniferous and Permian Stratigraphy. Royal Netherlands Academy of Arts and Sciences, Amsterdam, 584 pp.
- Karaseva, T.V., Kuznetsova, E.A. & Ponomareva, G.Yu. (Eds.) 2011. Permian: Stratigraphy, Paleontology, Paleogeography, Geodynamics and Mineral Resources" devoted to 170 anniversary of the opening of the Permian System. Perm State University, Perm, Russia, 298 pp.
- XVIII International Congress on the Carboniferous and Permian, August 11–15, 2015, Abstracts Volume, Kazan, Russia, 228 pp.

In addition, we received reprints of numerous articles on foraminifers, stratigraphy, paleontology and geology of the Upper Paleozoic.

A new genus—*Olgaorlovella*—was named after me in Vachard, D., Krainer, K. & Lucas, S.G. 2015. Late Early Permian (late Leonardian; Kungurian) algae, microproblematica, and smaller foraminifers from the Yeso Group and San Andres Formation (New Mexico; USA). *Palaeontologia Electronica* 18.1.21A: 1–77.

MOLLUSC COLLECTION

Henk K. Mienis and Oz Rittner

Research

During the academic year 2016/17 we continued to carry out research in the fields of taxonomy, systematics, nomenclature, Lessepsian migration, exotic and invasive species among the mollusc fauna of Israel and various aspects of archaeomalacology.

New records from Israel

An "invasion" of unreported Nudibranchs from the Mediterranean coast of Israel:

- Three specimens of *Phidiana militaris* (Alder & Hancock, 1864) were photographed by Shevy Rothman on the wreck of the Italian submarine "Scire" at a depth of 30 m in Haifa Bay (Rothman, Mienis and Galil, 2017). This is the first record of this Indo-Pacific facelinid species in the Mediterranean Sea.

- The pelagic nudibranch *Phylliroe bucephala* Péron & Lesueur, 1810 was observed for the first time along the Mediterranean coast of Israel off Akhziv by Alex Geyzner on 25 February 2017 (Geyzner, Rothman and Mienis, 2017).
- The chromodorid slug *Felimida luteorosea* (Rapp, 1827) was photographed by a submersible at a depth of 112 m off Herzliyya. This is the first record of the species from the Mediterranean coast of Israel.
- Another first time record was documented by Shevy Rothman, who photographed *Trapania tartanella* (von Ihering, 1886) at a depth of 30 m again on the wreck of the Italian submarine "Scire" in the bay of Haifa on 29 September 2017.

Descriptions of new mollusc species:

- The enigmatic *Theodoxus* species living in the Octagon Pool near Tabgha was recently described in the second and final volume of the monograph dealing with the living Neritidae by Tom Eichhorst (2016) as *Theodoxus (Neritaea) octagonus* Eichhorst, 2016. More information on that species was provided by Mienis and Rittner (2017).
- A minute marine gastropod collected at depths of 190 and 80 m off Elat in the Gulf of Aqaba in 1968 was described as *Palisadia rittneri* Mienis, 2017, family Eulimidae (Mienis, 2017a). It is only the second known recent species of *Palisadia*.
- *Xerocrassa zviae* Mienis, 2017 is an endemic land snail mainly known from the area of En Gedi (Mienis, 2017b).

Other faunistic records

- The mysterious *Helicella (Xerocrassa) seetzeni scharonica* F. Haas, 1936 has turned out to be a dwarf form of *Xerocrassa simulata simulata* (Ehrenberg, 1831) (Mienis, 2017c).
- Fieldwork in the Arad area revealed the presence of an undescribed species of *Xerocrassa*. A formal description of it is in preparation.
- Fieldwork by our colleagues of the Israel National Center for Aquatic Ecology in the drainage area of the Qishon River showed that the invasive gastropod *Gyraulus chinensis* and bivalve *Mytilopsis sallei* are firmly established in that stream.

Support with identifications

Various ecological studies on the presence of molluscs in Israel are currently being carried out by a number of amateur zoologists like Dr. Aharon Dotan, Dr. Eldad Elron, and by various institutes (see below). They benefited from our expertise through the identification of their material. The major part of the identified material was retained for permanent storage in the Steinhardt Museum of Natural History.

Cooperation with the Plant Protection and Inspection Services of the Ministry of Agriculture

Mrs. Svetlana Vaisman of the mollusc unit of the Plant Protection and Inspection Services (PPIS) at Bet Dagan continued to work 4–5 hours a week in our mollusc collection. Most of the time she is picking and identifying micro-molluscs from leaf litter and soil samples collected at various anthropogenic sites in Israel. This academic year Mrs. S. Vaisman brought us for identification 26 samples of land and freshwater snails intercepted by inspectors from the PPIS from either agricultural shipments arriving from abroad or found on local material grown in nurseries. Noteworthy were the large numbers of snails intercepted on vegetables regularly arriving in Israel from the Gaza Strip via the Kerem Shalom border post. These vegetables are intended for consumption in the West Bank.

Cooperation with the Israel Nature and National Parks Protection Authority

Like in previous years we received some mollusc material collected during the BioBlitz project in several Marine Nature Reserves along the Mediterranean coast of Israel. The results were rather disappointing from both a quantitative and qualitative point of view.

Cooperation with archaeologists

During the past academic year, we continued to work on the archaeomalacological material from the following sites:

- Jewish Quarter in the Old City of Jerusalem excavated by the late Prof. Nahman Avigad and more recently by Dr. Hillel Geva;
- Horbat Bet Loya excavated by Dr. Oren Gutfeld;
- Ramla via Dr. Ravit Nenner-Soriano;
- Tiberias excavated by the late Prof. Izhar Hirschfeld;
- various Chalcolithic and Early Bronze sites excavated by Dr. Edwin van den Brink;
- Tell es-Safi/Gath excavated by Prof. Aren M. Maeir.

Cooperation with visiting scientist

Dr. Ana Turchetti-Maia, a postdoctoral student at the Hebrew University of Jerusalem, had a look at part of the Mediterranean cephalopods present in the SMNH mollusc collection.

Dr. Paolo G. Albano of the Department of Paleontology of the University of Vienna, Austria, started a study of the historical ecology of ecosystems affected by alien species introductions. During his presence in Israel information was discussed and exchanged dealing specifically with Lessepsian migration.

Cooperation with malacologists abroad

The Dutch–German team consisting of Jordy G. van der Beek, Frans de Jong, Dr. Bernd Sahlmann and Dr. Vollrath Wiese continues to revise the Scaphopoda from the Red Sea.

New acquisitions

New material, not only from colleagues at various institutes but also from private collectors arrived regularly during the past year. The identifications of this new material was usually immediately checked and specimens were prepared for permanent storage in the collection.

Name	**Brief description of the material**
M. and A. Avisar	Marine molluscs Red Sea and world-wide
D. Bar-Natan	Land snails from Israel
D.E. Bar-Yosef	Marine molluscs from South Africa and Senegal
U.J. Bar Zeev	Land snails from Israel, Belgium, China, Vietnam
A. Dotan	Marine molluscs
T. Eshkoly	Land and freshwater molluscs from Israel
B. Gal	Land snails from Kibbutz Lahav
Y. Hershkovitz	Land and freshwater molluscs from Israel
D. Keppens (via M. Keppens)	Marine molluscs from France
M. Keppens	Molluscs world-wide
K. Keppens-Dhondt	Marine molluscs.

D. Korkos	Marine molluscs from the Red Sea
B. Levi	Land snails intercepted from imports
M. Maor	Land snails intercepted from imports
D. Mienis	Land snails from Israel
H.K. Mienis	Molluscs from the Netherlands, Israel, Nigeria, modern shell beads and shell trumpet from Nepal
R. Ortal	Land snails from Malta
O. Rittner	Land snails from Israel
A. Singer (via Avisar)	Marine molluscs Red Sea and world wide
B.S. Singer	Marine molluscs from the Mediterranean, Red Sea
S. Vaisman	Land and freshwater snails from Israel
R. Vanwalleghem	Land snails from Belgium
U. Ziv	Land snails from Israel

Noteworthy among this material is that donated by M. and A. Avisar, which formed part of the collection of the late Mr. Abraham Singer, long time member of the former Israel Malacological Society (see elsewhere in the annual report).

Computerization of the collection

The computerization of the mollusc collection is carried out by Oz Rittner (collection of recent molluscs and occasional arrivals of fossil material) and Dr. Daniella E. Bar-Yosef Mayer (fossil molluscs in the paleontological collection of Hanan (Hans) Bytinski-Salz). At the moment 63,001 samples (excluding fossils) representing 10,920 taxa (including fossil ones) in the mollusc collection have been computerized. The majority of the new species and subspecies (501) which we could add this year to the collection were again mainly from the Paleontological collection of the late Prof. Hanan (Hans) Bytinski-Salz.

The Malacological library

The library is a most important tool for taxonomic and systematic studies in the Mollusc Collection.

Recent donations

- Books donated by Prof. Abraham Ben-Reuven:
- Barash, A. and Zenzipper, Z., 1991. *Mediterranean Molluscs of Israel*. The Society for the Protection of Nature, Tel Aviv,173 pp.
- Oliver, A.P.H., 1975. *The Hamlyn Guide to Shells of the World*. The Hamlyn Publishing Group Limited, London, New York, Sydney, Toronto, 320 pp.
- Vine, P., 1986. *Red Sea Invertebrates*. Immel Publishing, London, 224 pp.
- Books donated by Henk K. Mienis:
- Edelman-Furstenberg, Y., 2008. Ecological trens across a human-impact organic load gradient along the Mediterranean shore: benthic macrofaunal evidence. *Report GSI*/23/08: 38 pp + 8 plts.
- Edelman-Furstenberg, Y. and Faershtein, G., 2010. Molluscan fauna of the Gulf of Elat: indicators of ecological change. *Report GSI*/15/10: 44 pp. + 44 plts.
- Gvirtzman, G., Martinotti, G.M. and Moshkovitz, S., 1989. Stratigraphy of the Plio-Pleistocene sequence of the Mediterranean coastal belt of Israel and its implications for the evolution of the Nile cone. *Report GSI*/49/89: 41 pp. + 5 figs.

- Haag, W.R. and Cicerello, R.R., 2016. A distributional atlas of the freshwater molluscs of Kentucky. *Kentucky State Nature Preserves Commission. Scientific and Technical Series*, 8: XI+299 p.
- Hauff, B., 1960. *Das Holzmadenbuch*. Hohenlohe'sch Buchhandlung Ferdinand Rau, Öhringen, 80 pp. [Fossils from the "Black Jura"]
- Rankevich, D., 1997. *Genetic variation and resistance to desiccation in populations of land snails on the northern and southern slope of Nahal Oren*. PhD Thesis. Technion – Israel Institute of Technology. 140 pp. [in Hebrew]
- Rosen, A., 1986. Quaternary alluvial stratigraphy of the Shephela and its paleoclimatic implications. *Report GSI*/25/86: 38 pp.
- Vogt, D., Hey-Reidt, P., Groh, K. and Jungbluth, J.H., 1994. Die Mollusken in Rheinland-Pfalz. –Statusbericht 1994- *Fauna und Flora in Rheinland-Pfalz Zeitschrift für Naturschutz, Beiheft* 13: 1–219.

- Book donated by Antonio Terlizzi (via Ana Turchetti Maia):

- Scuderi, D. and Terlizzi, A., 2012. *Manuale di Malacologia dell'Alto Jonio*. Edizioni Grifo, 188 pp.

In addition, we have received many reprints and numerous journals from zoological institutes or malacological societies in exchange for *Triton*, an independent malacological journal published in Israel.

SEVENTH ADDITION TO THE CATALOGUE OF TYPE SPECIMENS IN THE MOLLUSC COLLECTION OF THE STEINHARDT MUSEUM OF NATURAL HISTORY

Henk K. Mienis

Type material of 5 taxa is added to the provisional lists of type specimens present in the Mollusc Collection of the Steinhardt Museum of Natural History – Israel National Center for Biodiversity Studies (SMNH MO) of the Tel Aviv University (Mienis, 2010, 2011, 2012, 2013, 2014, 2015 and 2016). All these type samples were either donated to the Mollusc Collection during the academic year 2016/17 or recognized in the existing collection as being type specimens.

Abbreviations:
HKM – former private collection of Henk K. Mienis.
HUJ MOL – Mollusc Collection, Hebrew University of Jerusalem.

GASTROPODA

- Family Neritidae

Nerita adenensis Mienis, 1978

Paratype SMNH MO 82022 (ex HKM 1788): Yemen, Crater Beach east of Aden.

- *Nerita (Cymostyla) luteonigra* Dekker, 2000

  Paratypes SMNH MO 65837/2 (ex HUJ MOL 40561 = ISRSE 62/2032): Eritrea, Dahlak Archipelago, Entedebir Island, Amphioxus Bay.

- Family Pyramidellidae

  Turbonilla cangeyrani Ovalis and Mifsud, 2017

  Paratype SMNH MO 81707: Turkey, Tasucu, 8 m depth.

- Family Enidae

  Euchondrus desertorum Rochanaburananda in Forcart, 1981

  Paratypes SMNH MO 81957/2: Israel, Negev, western part of Wadi Nafkh.

- Family Hygromiidae

  Xerocrassa zviae Mienis, 2017

  Paratypes SMNH MO 68146/4: Israel, Ramat Hever between Har Zeruya and Nahal Hever.

  Paratypes SMNH MO 69680/9: Israel, Nahal Harduf, plateau viewing the canyon from above.

References

Dekker, H., 2000. The Neritidae (Gastropoda) from the circumarabian seas, with the description if two new species, a new subgenus and a new genus. *Vita Marina*, 47 (2): 29-64.

Forcart, L., 1981. Neubeschreibungen von Landschnecken aus Palästina. *Basteria*, 45 (4-5): 97-108.

Mienis, H.K., 1978. Notes on recent and fossil Neritidae 8. *Nerita adenensis*, a new species from the Arabian Peninsula. Argamon, Israel Journal of Malacology, 6 (3-4): 30-36.

Mienis, H.K., 2010. Provisional catalogue of type specimens in the mollusc collection of the Tel Aviv University. In: *The National Collections of Natural History. Annual Report 2008/2009. Tel Aviv University*: 43-49.

Mienis, H.K., 2011. First addition to the catalogue of type specimens in the mollusc collection of the Tel Aviv University. In: *The National Collections of Natural History. Annual Report 2009/2010. Tel Aviv University*: 57.

Mienis, H.K., 2012. Second addition to the catalogue of type species in the mollusc collection of the Tel Aviv University. *In: The National Collections of Natural History.*

Annual Report 2010/2011, Tel Aviv University: 58-59.

Mienis, H.K., 2013. Third addition to the catalogue of type species in the mollusc collection of the Tel Aviv University. In: *The National Collections of Natural History.*

Annual Report 2011/2012, Tel Aviv University: 55-57.

Mienis, H.K., 2014. Fourth addition to the catalogue of type species in the mollusc collection of the Tel Aviv University. In: *The National Collections of Natural History.*

Annual Report 2012/2013, Tel Aviv University: 56-59.

Mienis, H.K., 2015. Fifth addition to the catalogue of type specimens in the mollusc collection of the Tel Aviv University. In: *The National Collections of Natural History.*

Annual Report 2013/2014, Tel Aviv University: 67-68.

Mienis, H.K., 2016. Sixth addition to the catalogue of type specimens in the Mollusc Collection of the Steinhardt Museum of Natural History. In: *The Steinhardt Museum of Natural History – Israel National Center for Biodiversity Studies, Annual Report 2014/2015*: 76-77.

Mienis, H.K., 2017. *Xerocrassa zviae*, a new species of land snail from the Judean Desert, Israel (Mollusca, Gastropoda, Hygromiidae). *Triton*, 35: 25-28.

Ovalis, P. and Mifsud C., 2017. A new species of Turbonilla (Risso, 1826)

(Pyramidellidae: Turbonillinae) from SE Turkey. *Triton,* 35: 1-4.

COLLECTING TRIPS AND EXPEDITIONS

A dynamic archive, our Natural History Collections grow annually through donations, research projects, and collecting trips and expeditions. Many research projects have added numerous specimens to our collections, while other collections have benefited from focused collecting trips. Here we report on recent collecting activities of our scientists.

COLLECTING TRIPS OF THE ENTOMOLOGY DEPARTMENT

Moshe Gershon

Several members of the entomology team attended the NPA ecological camp for a survey of the flora and fauna of Biq'at Hureqanya (Judean Desert) on March 14–15. Overall, 1,053 insect specimens of 300 species were collected (mainly Coleoptera, Hymenoptera, Diptera and Heteroptera), including a few rare species of Coleoptera and Heteroptera.

L. Friedman undertook eight collecting trips (1–3 days) around Israel: Central Negev, Arava and Elat (with S. Zonstein, W. Kuslitzky and B. Shalmon, 3 days), Jordan Valley, Arava and Southern Negev (with N. Dorchin, 3 days), Western and Central Negev (with N. Dorchin and A. Freidberg, 1 day), Central Negev (with N. Dorchin, 1 day), Har Meron (with S. Zonstein, 2 days), Har Hermon and Golan Heights (with A. Freidberg, 2 days), Nahal Daliyya Nature Reserve and 'Atlit (1 day), HaZorea' water pools and Har Gahar (1 day). He participated in four trips during the entomological faunistic course (with N. Dorchin, Shoham Forest, Negev and Dead Sea, Golan and Galilee, Nizzanim), combining teaching with collecting.

W. Kuslitzky collected parasitic wasps with Malaise traps in Lotan (January– May 2017), and with a sweeping net in various localities, focussing on the insect fauna associated with castor bean *Ricinus communis*. The material was sorted to different levels, and most reared parasitoids were determined to the species level.

V. Kravchenko and Z. Yefremova went on the following collecting trips in Israel in 2017: April 16–20 and April 24–26 Negev and Arava, May 16–19, June 11–15 and June 25–28 Mt. Hermon.

MALACOLOGICAL FIELDWORK IN ISRAEL

Henk K. Mienis and Oz Rittner

During the academic year 2016–2017 fieldwork was carried out only on 5 days. Twice molluscs were collected in cooperation with Mrs. Svetlana Vaisman of the Plant Protection and Inspection Services of the Ministry of Agriculture in Bet Dagan. During those outings transport was organized and fully covered by the PPIS.

Abbreviations:

PPIS – Plant Protection and Inspection Services, Ministry of Agriculture.

SMNH – The Steinhardt Museum of Natural History, Tel Aviv University.

22 December 2016 – Hiriya

Participants: Dr. Moshe Weiss, Dr. Yoav Motro and Svetlana Vaisman (all PPIS) and Henk Mienis (SMNH).

The purpose of the fieldwork was to check water ponds on the former waste dump Hiriya, now the Ariel Sharon Park, for the presence of Apple snails (*Pomacea* species). Apple snails had been seen and collected at Hiriya already on 13 July 2015 (Mienis and Rittner, 2016). In spite of the warnings given to the Park ecologist that he had to clean the ponds of Apple snails numerous live specimens of *Pomacea maculata* were collected not only from the water filters but also from the basins. In addition, we found specimens of *Planorbella duryi* and *Physella acuta.* All these freshwater snails are invasive species either from South America (*Pomacea*) or North America (*Planorbella* and *Physella*).

23 January 2017 – Kannot

Participants: Svetlana Vaisman (PPIS) and Henk Mienis (SMNH).

The purpose of the fieldwork was a check of the facilities of "Wonderfish", a hatchery of aquarium fish, for the presence of the Apple snails (*Pomacea* species). Indeed, two Apple snail species of were found on the premises: *Pomacea diffusa* and *Pomacea maculata.* Both species are of South-American origin. The European Plant Protection Organization has blacklisted *Pomacea* spp. in Europe. It is forbidden to import, cultivate and sell them in Europe. Since all shipments from Israeli aquaculture to Europe have to be accompanied by a statement that the material has been grown without the presence of teh Apple snails, the local PPIS of the Ministry of Agriculture has blacklisted all species belonging to the family Ampullariidae in Israel too. The owner of the firm "Wonderfish" has therefore received a warning that he has to remove all Apple snails from his facilities. In addition to the Apple snails, the presence of numerous specimens of *Physella acuta* was noted in most of the aquaria.

8 December 2015 – Even Sapir

Participants: Ori Peleg (TAU), Oz Rittner and Henk Mienis (SMNH).

The purpose of the fieldwork was to check the burnt hill slopes between Even Sapir and the Hadassah Ein Kerem Hospital, Jerusalem, for the presence of terrestrial gastropods. In spite of fine weather and flowering wild bulbs (*Narcissus*, *Crocus* and *Colchicum*) hardly any living snails were seen. Fortunately, four specimens of *Deroceras berytensis*, a local slug species, were found. They might turn out to be of use when someone decides to make a thorough revision of that difficult group of slugs.

31 January 2017 – Yafo

Participants: Oz Rittner and Henk Mienis (both SMNH).

The purpose was to investigate the Protestant Cemetery in Yefet Street for the presence of terrestrial gastropods. Only very few species were found: *Elia moesta moesta*, *Eopolita protensa jebusitica*, *Limacus flavus*, *Deroceras berytensis*, *Monacha syriaca*, *Xeropicta vestalis joppensis*, *Xerotricha conspurcata* and *Cornu aspersum megalostomum.* According to the Christian caretaker land snails are still being sold in Yafo mainly to the Christian community. *Cornu aspersum megalostomum* is being sold for 1 sheqel each, while the price of *Theba pisana* is 35 sheqel/kilogram (Mienis and Rittner, 2017). Another visit during slightly warmer weather is planned in Spring 2017.

6 March 2017 – Yafo

Participant: Henk Mienis (SMNH)

During this second visit to the Protestant Cemetery in Yefet Street soil samples were taken at various sites within the cemetery. These samples were checked by Mrs. Svetlana Vaisman (PPIS) for the presence of minute gastropods which were overlooked during our previous visit. This resulted in the registration of

the following additional species: *Truncatellina cylindrica*, *Calaxis hierosolymarum*, *Ferrussacia (Pegea) kervillei* and *Caracollina lenticula* (Mienis, Rittner and Vaisman, 2017).

7 March 2017 – Nahal Hemar and Arad

Participants: Oz Rittner and Henk Mienis (both SMNH).

The purpose of the fieldwork was to collect additional material of *Xerocrassa* in the Nahal Hemar/Nahal Gemalim area in order to get a better idea of the distribution of *Xerocrassa pseudojacosta* in Israel and to collect material of an apparently undescribed *Xerocrassa* species from the surroundings of Arad. In the Nahal Hemar/Nahal Gemalim area east of road 258 we managed to collect indeed material belonging to the *Xerocrassa pseudojacosta*-complex at three different localities. The shells in two populations differ from the usual flat upper whorls as seen in typical *Xerocrassa pseudojacosta* (Forcart, 1976) by there more dome-shaped shells. Back in the mollusc collection we found among the new material one sinistral specimen (Mienis, Rittner and Ben-Natan, 2017). Other specimens found with *Xerocrassa pseudojacosta* were *Buliminus glabratus, Sphincterochila zonata filia, Sphincterochila zonata zonata*, *Xerocrassa seetzenii seetzenii* and *Levantina spiriplana lithophaga.* In the hotel area of Arad we found indeed numerous specimens of a still undescribed *Xerocrassa* species often together with typical *Xerocrassa seetzenii seetzenii* under the same stones. Other species present included *Buliminus therinus*, *Sphincterochila prophetarum*, *Xeropicta* cf. *ilanae* and *Levantina spiriplana lithophaga*.

The new species had been collected already in the 1990s by the late Mrs. Shimrit Ginott-Lahav, at that time an MSc student at the Hebrew University of Jerusalem, but it was not recognized by her as being new to science.

References

Forcart, L., 1976. Die Cochlicellinae und Helicellinae von Palästina und Sinai. Archiv für Molluskenkunde, 106 (4-6): 123-189.

Mienis, H.K. and Rittner, O., 2016. Malacological fieldwork in Israel. The Steinhardt Museum of Natural History – Israel National Center for Biodiversity Studies, Annual Report 2014/2015: 81-88.

Mienis, H.K. and Rittner, O., 2017. Land snails are still being offered for sale in Yafo, Israel. Natuurhistorische en Andere Notities – Natural History and Other Notes, 13: 3-4.

Mienis, H.K., Rittner, O. and Ben-Natan, 2017. On the distribution of *Xerocrassa pseudojacosta* in Israel with a first record of a sinistral shell. Triton, 36: 22-25.

Mienis, H.K., Rittner, O. and Vaisman, S., 2017. Terrestrial gastropods from the Protestant Cemetery in Yafo, Israel. Triton, 36, pp. 13-18.

MALACOLOGICAL FIELDWORK IN THE NETHERLANDS

Henk K. Mienis

It has become a tradition that I am visiting the Netherlands in autumn. This time this event took place from 10 September to 15 October 2017. During previous years my base was always situated in Purmerend, a town about 12 km north of Amsterdam in North-Holland. Since my family over there moved recently to Joure in Friesland I carried out my fieldwork this time in a complete new region of the Netherlands.

The province Friesland in general and that of Joure in particular is characterized by its green meadows and numerous lakes and canals. Here and there small woods are present which are characterized by the domination of Silver birch *Betula pendula*, a tree species which prefers acidic soils. For three weeks I have criss-crossed by bicycle the surroundings of Joure in order to get a better impression of the opportunities to carry out malacological fieldwork.

In addition I have also spent again two weeks on the Dutch Wadden Sea island Terschelling, which as a matter of fact belongs also to the province Friesland.

Malacological fieldwork was carried out with the followings objectives:

Friesland-Joure:

a. A follow up survey of the land- and freshwater molluscs of Heremastate, a large park in Joure;
b. A preliminary survey of the land- and freshwater molluscs of the Famberhorst, a closed private Nature Reserve;
c. A preliminary survey of the land- and freshwater molluscs of the Twigen, a closed Nature Reserve owned by the municipality Fryske Marren (the Frisian Lakes);
d. A first survey of Wilhelmina-Oard, a Nature Reserve belonging to "It Fryske Gea";
e. Various additional smaller observations.

Friesland-Terschelling:

a. A follow up survey of the freshwater molluscs of the renovated Doodemanskisten near West-Terschelling;
b. A follow up survey of the freshwater molluscs of the "Eerste Plak" (Liesingerplak), a wetland near Lies;
c. A follow up survey of the "Bulldozerplas" near the "Stuifdijk" in the Nature Reserve "De Boschplaat";
d. A second survey of the watering hole along the bicycle-path from Lies to Formerum near the Sea;
e. Various additional smaller observations.

Special attention was given to the presence of exotic species. Part of the collected material has been permanently lodged in the Mollusc Collection of the Steinhardt Museum of Natural History.

Results

Fieldwork in the surroundings of Joure

a. Park Heremastate in Joure has been briefly surveyed for the presence of land snails in 2013, 2014 and 2015. The preliminary results of these investigations were published by Mienis (2014 and 2016a). This time both the land snails and freshwater molluscs have been investigated on the following dates: 11–13 and 15 September 2017 and 2 October 2017. This has resulted in the recording of 26 terrestrial species: *Carychium minimum*, *Oxyloma elegans*, *Succinea putris*, *Cochlicopa lubrica*, *Punctum pygmaeum*, *Discus rotundatus*, *Euconulus fulvus*, *Euconulus praticola*, *Zonitoides nitidus*, *Aegopinella nitidula*, *Nesovitrea hammonis*, *Oxychilus alliarius*, *Oxychilus cellarius*, *Vitrina pellucida*, *Lehmannia valentiana*, *Limax maximus*, *Deroceras invadens*, *Deroceras laeve*, *Deroceras reticulatum*, *Arion circumscriptus*, *Arion distinctus*, *Arion rufus*, *Trochulus hispidus*, *Arianta asbustorum*, *Cepaea nemoralis* and *Cornu aspersum* and ten aquatic species: *Bithynia leachii*, *Bithynia tentaculata*, *Valvata piscinalis*, *Radix balthica*, *Anisus vortex*, *Bathyomphalus contortus*, *Planorbarius corneus*, *Planorbis planorbis*, *Anodonta cygnea* and *Sphaerium corneum*.

I looked in vain this time for another eight land snails and four freshwater molluscs, which had been encountered during previous investigations. These were *Carychium tridentatum* (2015), *Cochlicopa*

lubricella (2013), *Vallonia excentrica* (2014), *Vitrea crystallina* (2013 and 2014), *Tandonia budapestensis* (2015), *Tandonia sowerbyi* (2013), *Lehmannia marginata* (2015) and *Arion intermedius* (2013, 2014 and 2015); and *Lymnaea stagnalis* (2015), *Physa fontinalis* (2015), *Ferrissia californica* (2015) and *Gyraulus albus* (2015).

The use here of the name *Ferrissia californica* needs some clarification. Until recently I employed the name *F. clessiniana*, but more and more information turns up that we are dealing with a North-American species that was known until recently as *Ferrissia fragilis* (Tryon, 1863) (see Walther *et al.*, 2006), but *Ferrissia californica* (Rowell, 1863) has turned out to be an even older name (Vecchioni *et al.*, 2017).

According to this information 34 terrestrial and 14 aquatic species are now known from Park Heremastate.

b. The Famberhorst is since 1984 a closed private Nature Reserve owned by the Bergsma family. It serves as a connection between Park Heremastate to the south-east and Nature Reserve the Twigen to the north-west. It is an undulating small site of about 3 hectares. Its south-eastern part is rather wet due to the presence of several shallow "ponds" which are fed by seepage water. The north-western part is somewhat higher. Along the north side the Jonkersloot is running, a ditch-like waterway separating the Jonkerpolder from Famberhorst. Water from the Jonkersloot is occasionally released into a small ditch at the south side of the reserve.

The Famberhorst was surveyed for the presence of molluscs on 11 and 12 October 2017. This first survey resulted in the registration of 19 species of terrestrial gastropods (snails and slugs): *Carychium minimum*, *Oxyloma elegans*, *Succinea putris*, *Discus rotundatus*, *Punctum pygmaeum*, *Euconulus praticola*, *Zonitoides nitidus*, *Aegopinella nitidula*, *Nesovitrea hammonis*, *Oxychilus alliarius*, *Limax maximus*, *Deroceras invadens*, *Deroceras laeve*, *Deroceras reticulatum*, *Arion circumscriptus*, *Arion hortensis*, *Arion subfuscus*, *Arianta arbustorum* and *Cepaea nemoralis*, and 29 aquatic species: *Viviparus contectus*, *Bithynia leachii*, *Bithynia tentaculata*, *Potamopyrgus antipodarum*, *Valvata cristata*, *Acroloxus lacustris*, *Physa fontinalis*, *Physella acuta*, *Lymnaea stagnalis*, *Myxas glutinosa*, *Radix balthica*, *Stagnicola palustris*, *Anisus leucostoma*, *Anisus vortex*, *Bathyomphalus contortus*, *Ferrissia californica*, *Gyraulus albus*, *Gyraulus crista*, *Planorbarius corneus*, *Planorbis carinatus*, *Planorbis planorbis*, *Segmentina nitida*, *Anodonta cygnea cellensis*, *Dreissena bugensis*, *Dreissena polymorpha*, *Musculium* or *Sphaerium* sp., *Sphaerium corneum*, *Pisidium obtusale* and *Pisidium nitidum*.

Among the freshwater species are some surprises:

- *Viviparus contectus* and both invasive *Dreissena* species, found in the small ditch in the southern part of Famberhorst, have to be considered intruders which entered the reserve by the release of water from the Jonkersloot into that ditch;

- *Anisus leucostoma* and *Pisidium obtusale* where encountered in the shallow pools, which are occasionally dry;

- *Myxas glutinosa*, a critically endangered species in the Netherlands (de Bruyne *et al.*, 2003), and *Planorbis carinatus* were both collected in areas with dense aquatic vegetation but in separate areas;

- An unknown *Sphaerium* or *Musculium* species was encountered at the eastern end of the southern ditch. The shells look very much like those of *Musculium transversum* as illustrated in Jansen (2016), however it is doubtful that they represent that invasive species from North America. Moreover, a recent DNA research carried out on *Sphaerium* and *Musculium* has revealed that *transversum* does not belong to the genus *Musculium* (Lee and Foighil, 2003). More material has to be collected in the Famberhorst in order to reveal the true identity of this bivalve species.

Altogether the presence of 48 different land- and freshwater molluscs has been established during the first malacological survey of the Famberhorst, an amazing number for such a small reserve.

c. A preliminary survey of the land- and freshwater molluscs of the Twigen, a closed Nature Reserve owned by the municipality the Fryske Marren. Since 2000 it is managed by the "Foundation Nature Reserve The Twigen". The nature reserve is located west of Joure between Highway A-7 and the Tramwei. In the south it starts near the Woudfennen with a unique Elm arboretum, where 40 different types of *Ulmus* have been planted. It is the largest collection of Elms in Europe. The arboretum is also exploited as a grazing area for nine different ancient races of sheep. The Twigen ends in the north near the Alde Wei, an arm of the Langwarder Wielen, one of the numerous Frisian Lakes. Especially the eastern part of this oblong area is rather soggy. The central area is densely wooded, while the western fringe is somewhat drier because it is a little bit higher than the rest of the reserve. A preliminary survey of the Twigen took place on 8 October 2017 together with Mrs. Judith Gerritzen, while a more focussed investigation was carried out by me on 9 October 2017.

The following 19 terrestrial gastropods were encountered: *Carychium minimum*, *Oxyloma elegans*, *Succinea putris*, *Succinella oblonga*, *Cochlicopa lubrica*, *Euconulus praticola*, *Zonitoides nitidus*, *Aegopinella nitidula*, *Nesovitrea hammonis*, *Oxychilus alliarius*, *Oxychilus cellarius*, *Deroceras laeve*, *Deroceras reticulatum*, *Arion circumscriptus*, *Arion intermedius*, *Arion rufus*, *Arion subfuscus*, *Arianta arbustorum* and *Cepaea nemoralis*, while the presence of 21 species of aquatic molluscs could be registered: *Bithynia leachii*, *Bithynia tentaculata*, *Potamopyrgus antipodarum*, *Valvata cristata*, *Valvata piscinalis*, *Acroloxus lacustris*, *Lymnaea stagnalis*, *Radix balthica*, *Stagnicola palustris*, *Physa fontinalis*, *Anisus vortex*, *Bathyomphalus contortus*, *Gyraulus albus*, *Planorbarius corneus*, *Planorbis carinatus*, *Planorbis planorbis*, *Segmentina nitida*, *Musculium lacustris*, *Sphaerium corneum*, *Pisidium obtusale* and *Pisidium milium*.

d. A first survey of Wilhelmina-Oard, a Nature Reserve belonging to "It Fryske Gea" in Sint Nicolaasga, was carried out on 1 and 3 October 2017. Like all other woodlands in this part of Friesland the soil is rather acidic and less suitable for the development of a rich mollusc fauna. Not surprisingly only nine different species were encountered of which five were slugs: *Cochlicopa lubrica*, *Euconulus praticola*, *Nesovitrea hammonis*, *Oxychilus alliarius*, *Limax maximus*, *Arion circumscriptus*, *Arion intermedius*, *Arion rufus* and *Arion subfuscus*. In the garden and woods of the nearby home for the elderly with almost the same name: Wilhelmina-Oord two additional species were encountered: *Cepaea nemoralis* and *Cornu aspersum aspersum*

e. Brief records from various other sites:

- In Joure at the so-called beach near the "Ljip" nine terrestrial gastropods: *Succinea putris*, *Zonitoides nitidus*, *Deroceras invadens*, *Deroceras laeve*, *Deroceras reticulatum*, *Arion circumscriptus*, *Arion intermedius*, *Cepaea nemoralis* and *Cornu aspersum*, and ten aquatic molluscs: *Bithynia leachii*, *Bithynia tentaculata*, *Potamopyrgus antipodarum*, *Lymnaea stagnalis*, *Stagnicola palustris*, *Physa fontinalis*, *Physella acuta*, *Anisus vortex*, *Planorbarius corneus* and *Planorbis planorbis*, were seen on 4 October 2017. *Deroceras invadens* has to be considered a rather invasive species which may cause damage in agriculture and horticulture.

- At another locality in Joure: the corner of the Harddraversweg and the Omkromte, the invasive species *Hygromia cinctella* was collected from several shrubs among them Blackberries (*Rubus*), trees like Oak (*Quercus*) and Birch (*Betula*) and climbers like Hedge bindweed (*Calystegia sepium*) and Hop (*Humulus*

lupulus). This Mediterranean snail occurred over there in fair numbers together with *Cepaea nemoralis* and *Cornu aspersum*. It is the first record of *Hygromia cinctella* for this part of Friesland.

- On 4 October 2017 the nature area Swettepoel, a small lake and the surrounding woods north-west of Broek not far from Joure, could only be checked for the presence of terrestrial gastropods. Due to a sudden mysterious death of most of the fish living in the lake it was not allowed to survey the water. The presence of 11 species could be established: *Cochlicopa lubrica*, *Vallonia costata*, *Discus rotundatus*, *Zonitoides nitidus*, *Aegopinella nitidula*, *Nesovitrea hammonis*, *Oxychilus alliarius*, *Deroceras reticulatum*, *Arion sylvestris*, *Arianta arbustorum* and *Cepaea nemoralis*.

- The Haulsterwoods south of Haskerhorne were briefly visited on 10 October 2017. The woodland grows on a rather acidic soil. The area falls under the jurisdiction of the State Forestry Service. Only seven species of terrestrial gastropods were seen: *Oxyloma elegans*, *Oxychilus alliarius*, *Limax maximus* (some very large specimens), *Arion circumscriptus*, *Arion intermedius*, *Cepaea nemoralis* and *Cornu aspersum*.

Fieldwork on the island Terschelling

a. On 22 and 28 September 2017 a follow up survey of the freshwater molluscs was carried out of the renovated Doodemanskisten near West-Terschelling. For more information concerning the results of previous surveys I refer to Mienis (2016b and 2017c). This year *Stagnicola corvus* was found for the first time in the Doodemanskisten. At least *Pisidium milium* is also living in the lake. On the humid banks of the lake the land snails *Zonitoides nitidus* and *Deroceras laeve* were encountered.

b. A follow up survey of the freshwater molluscs of the "Eerste Plak" (Liesingerplak), a wetland near Lies (see Mienis, 2017c) carried out on 19 and 24 September 2017 resulted in the find of several specimens belonging to *Anisus leucostoma*. This planorbid snail is a characteristic species for temporary dry habitats. So far it had not been recorded from the "Eerste Plak". Besides *Pisidium milium*, *Pisidium obtusale* seems to live in this temporary lake.

c. A follow up survey of the "Bulldozerplas" near the "Stuifdijk" in the Nature Reserve "De Boschplaat" was carried out on 19 and 27 September 2017. The water level in this small artificial lake was standing about 1 meter higher than in autumn 2016. It covered areas which had been dry in the previous year. This made surveying the aquatic mollusc fauna of the lake much more complicated. Only two freshwater gastropods were encountered: *Gyraulus albus* and *Planorbarius corneus*. The latter has to be considered a newcomer on Terschelling (Mienis, 2013) and was encountered for the first time in the Bulldozerplas in 2016 (Mienis, 2017a). This time three juvenile specimens were collected which show that a reproducing colony is present in the lake. Some tiny Pea-mussels were found both in the sediments and among the aquatic weeds. They turned out to belong to *Pisidium milium, Pisidium subtruncatum* and probably a third *Pisidium* species. Along the banks two terrestrial gastropods were encountered: *Zonitoides nitidus* and *Deroceras laeve* near the water.

d. A second survey of the watering hole along the bicycle-path from Lies to Formerum near the Sea took place on 24 September 2017. Also here the water stood much higher than in autumn 2016 and again only the Lake fingernail clam *Musculium lacustre* was encountered (Mienis, 2017b). The first specimen of this small freshwater mollusc reached the pond most probably as a hitchhiker attached to an aquatic insect.

e. Various additional brief observations:

- *Cepaea nemoralis* forma *hyalozonata* is still living on the dunes bordering the Zwarteweg (formerly Duinweg) in West-Terschelling. In the past a rare colour-form of the Common garden snail *Cepaea nemoralis* with a white lip and transparent spiral bands has been found in the dunes bordering the Duinweg (now

Zwarteweg) in West-Terschelling (Mienis, 2010). This variety is known by the name *hyalozonata* and is probably caused by a genetic aberration. On 22 September I again visited the Zwarteweg and checked the low wall, which forms a barrier between the dunes and the road at two places ,for the presence of medium sized land snails. Everywhere *Cepaea nemoralis* and *Cornu aspersum* were encountered in large numbers. To my surprise I found among the *Cepaea*'s three additional specimens of the forma *hyalozonata*. Although the shells of *Cepaea nemoralis* at that locality are rather polychromic in basic colour (white, yellow, red and brown) and in the presence of 0–5 dark coloured spiral bands, all the snails of the variety *hyalozonata* are yellow, show a white lip of the aperture and all have one or more hyaline spiral bands.

- The invasive land snails on the low dunes of Dellewal opposite the yacht harbour of West-Terschelling are still represented by *Cernuella virgata*, *Monacha cantiana*, *Cepaea nemoralis* and *Cornu aspersum* (observations carried out on 22 and 28 September 2017).

All the data of the molluscs mentioned in this report will be forwarded to the "Atlasproject Nederlandse Mollusken" in Heemstede, the Netherlands.

Acknowledgement

I like to thank Mr. D.J. Bergsma for his permission to carry out a malacological survey of the Famberhorst.

References

De Bruyne, R.H., Wallbrink, H. and Gmelig Meling, A.W., 2003. *Bedreigde en verdwenen land- en zoetwatermollusken in Nederland (Mollusca). Basisrapport met voorstel voor de Rode Lijst*. Stichting European Invertebrate Survey – Nederland, Leiden and Stichting ANEMOON, Heemstede. 88 pp.

Jansen, B. [E.A.], 2016. *Veldgids Slakken en Mossels – land en zoetwater.* 2de Ed. KNNV Uitgeverij, Zeist. 272 pp.

Lee, T. and Foighil, D.Ó., 2003. Phylogenetic structure of the Sphaeriinae, a glade of freshwater bivalve molluscs, inferred from nuclear (ITS-1) and mitochondrial (16S) ribosomal gene sequences. *Zoological Journal of the Linnean Society*, 137: 245-260.

Mienis, H.K., 2010. Een zeldzame kleurafwijking van een gewone tuinslak in West-Terschelling. *Rinkelbollen*, 2010 (2): 6-9.

Mienis, H.K., 2013. De Posthorenslak op Terschelling en elders op de Waddeneilanden. *Rinkelbollen*, 2013 (1): 9-12.

Mienis, H.K., 2014. Een eerste verkenning van de landslakkenfauna van Heremastate in Joure. *Jaarverslag 2013 Schelpenwerkgroep Friesland*, 31: 32-33.

Mienis, H.K., 2016a. Een voorlopig overzicht van de landslakkenfauna van Heremastate in Joure, Friesland. *Spirula*, 406: 36-38.

Mienis, H.K., 2016b. Een eerste inventarisatie van de weekdieren in de vernieuwde Doodemanskisten. *Rinkelbollen*, 2016 (1): 18-20.

Mienis, H.K., 2017a. Een verrassende vondst van de Posthorenslak in de Bulldozerplas. *Rinkelbollen*, 2017 (3): 4-6.

Mienis, H.K., 2017b. An isolated population of *Musculium lacustre* in a watering hole in the dunes of Terschelling, Friesland, the Netherlands. *Ellipsaria*, 19 (4): 11-12.

Mienis, H.K., 2017c. Malacological fieldwork in the Netherlands. *Steinhardt Museum of Natural History – Israel National Center for Biodiversity Studies, Annual Report 2015/2016*: 40-43.

Vecchioni, L., Marrone, F., Arculeo, M. and Arizza, V., 2017. Are there autochthonous *Ferrissia* (Mollusca: Planorbidae) in the Palaearctic? Molecular evidence of a widespread North American invasion of the Old World. *The European Zoological Journal*, 84 (1): 411-419.

Walther, A.C., Lee, T., Burch, J.B. and Foighil, D.Ó., 2006. Confirmation that the North American Ancylid *Ferrissia fragilis* (Tryon, 1863) is a cryptic invader of European and East Asian freshwater ecosystems. *Journal of Molluscan Studies*, 723 (3): 318-321.

EDUCATION AND SCIENCE COMMUNICATION DEPARTMENT

Over the last two decades, Nature Campus was a precursor for the education and public outreach programs at the Steinhardt Museum of Natural History. It played a central role in an informal science education environment as a messenger of the biodiversity conservation knowledge and ethics. Over the last year, Nature Campus has been transformed into the Education and Science Communication Department of the Steinhardt Museum of Natural History, Israel National Center for Biodiversity Studies. While continuing to offer educational activities at the I. Meier Segals Garden for zoological research and at the Botanic Gardens, we also started to use the Museum exhibitions for pre-run-up of future activities.

In the past year, Nature Campus/the Education and Science Communication Department major accomplishments were:

1. Visits of school children, families, and other public categories to the Museum, Zoo and Botanic Gardens

In total, 13,055 people visited the premises during 2016–2017, of which 63% were schoolchildren, 10% were families and private groups, 15% were adults and 12% were academic students and professionals.

The schoolchildren groups comprised of 23% kindergarten children, 58% elementary school pupils, 15% middle school pupils and 5% high school students.

As regards the duration of the programs, 19% of visitors participated in one-hour programs, 36% in 1.5–2 hours, 31% in 3–4 hours and 15% in programs that lasted more than 4 hours.

We offered programs on more than 30 different themes: evolution, organisms and their environment, taxonomy, winter pools, life in the desert, Israel's wildlife, Israel's nature, adaptations, form and function, animal behavior, reptiles, senses, predators and prey, mammals, insect-plant interactions, body cover, food webs, biodiversity, the biodiversity crisis, the world of plants, bats, Israel's flora, flora of the world, useful plants, reproduction, conservation, flight, communication, fungi, birds, biomimicry, the natural history museum, and wetlands. The most popular theme, which 25% of all the visitors chose, was the Israel's wildlife.

The programs were conducted in the form of guided tours, science days, series and events. The most popular program type, in which more than 40% of visitors participated, was a guided tour at the Zoo.

2. Online visits

In addition to our 'conventional' visitors, we enjoyed over 364,000 page views of all websites within the Nature Campus domain. The statistics of the page is as follows: 32% Nature campus website, 26% EarthWeb website, 22% the Zoo website, 11% Evolution portal and 9% the collection website.

3. Preparation for opening the museum doors

In addition to the ongoing activities, much of our efforts in the last year were focussed on getting the education team and programs ready for the opening of the museum. We developed programs and activities that are based on the museum exhibitions, to kindergarten and school groups as well as to families and adult audience.

For the first time, we ran an in-service training course for our guides. The training focussed on interpretation in the museum. Twenty-two guides participated in the course, which lasted 32 hours.

THE ISRAEL TAXONOMY INITIATIVE

Conservation of biodiversity—the variety of life forms on the Earth—depends on the scientific knowledge and expertise. Government agencies, research institutes, and conservation organizations around the globe have identified an alarming gap between existing taxonomic knowledge of biodiversity and the need for this information to guide conservation practices. Taxonomic research is essential in order to identify the great majority of living organisms, to understand the evolution of life, and to halt the loss of species; however, the state of the discipline is presently inadequate. Many sophisticated tools and models—morphological, biochemical, and genetic—as well as advanced software, are available for taxonomists, but basic research lags seriously behind needs.

The Millennium Ecosystem Assessment—a UN taskforce to review the trends and implications of changes in global ecosystems—identifies the lack of knowledge of species and their geographic distributions as one of the impediments to sustainable development; the international treaty of the Convention on Biological Diversity initiated the Global Taxonomy Initiative in an effort to remedy this situation.

In Israel, where geographic, topographic, and climatic conditions have produced amazing and unique diversity of life, taxonomic research is declining. Thus, a major and urgent effort is required to salvage this field and to ensure the continuation of a critical discipline. In addition to nature and environmental conservation, taxonomic research has applied implications for agriculture, the economy, human welfare and health; it is therefore crucial that it remains viable in face of fleeting fashions in scientific research.

The Israel Taxonomy Initiative is a consortium of government ministries and agencies, research universities and higher education institutions that aims to promote training of taxonomists and basic knowledge of Israel's biodiversity by

- Providing graduate fellowships;
- Providing funding for overseas training for graduate students;
- Inviting taxonomists from the international scientific community to teach short courses on local species groups.

Our goal is to boost up the Israeli taxonomy and increase our knowledge of the biodiversity, thus promoting the contribution of science to conservation of Israel's ecosystems and developing the sustainable use of the country's natural assets.

The following grants have been awarded in 2016/7:

MSc Scholarships:

2016/17: Timna Dvir, Ascidians; Tanya Levi, Spiders.

Visiting Scholars:

2016/17: Jacob Larsen, harmful microalgae; Prashant Sharma, harvestmen spiders (Opiliones).

Plans for 2017/18:

The MSc program has been amended, and instead of offering MSc scholarships, two full PhD scholarships will be offered, and will include overseas training for the candidates. Six candidates have applied, and their proposals are under review.

During the coming academic year three taxonomic courses will be offered in Israel: Peter Konstantinidis from Oregon will give a course on larval fish at the Interuniversity Institute of Eilat; Dr. Jiri Hulcr from Florida will teach on bark beetles at the Faculty of Agriculture, Hebrew University; and Dr. Michael Wilson from Cardiff will teach the taxonomy of Auchenorrhyncha insects at Tel Aviv University.

THE ISRAEL NATIONAL AQUATIC ECOLOGY CENTRE

National project of aquatic taxonomy, biological state and ecological management

Yaron Hershkovitz, Tuvia Eshcoly, Adi Weiss, Ofir Hirshberg

Israel National Aquatic Ecology Centre (INAEC) was established in 2015 by the Israel Nature and Parks Authority, The Ministry of Environmental Protection and the Steinhardt Museum of Natural History. Its main goal is to support the management of aquatic ecosystems in Israel by integrating ecological and taxonomical information and developing national bioassessment tools, which are based on local criteria.

Main activities in 2016–17:

- **Ecological status and ecosystem services of Lake Kinneret catchment:** *setting the scene for the management of a multi-stressed region*. A 3-year bi-lateral project to develop the first aquatic assessment system, which is fully compatible with the European methodology for reporting on the ecological status of fluvial ecosystems in the Lake Kinneret Watershed. Supported by the German–Israeli Foundation (Research Grant Agreement Number: G-1272-203.13/2014).
- **Typological characterization of the stream network in Israel.** A first project to develop a typological map covering the full spectra of river types in Israel, according to the European standardization.
- **Ad-hoc survey for assessing the ecological impact of the Trout farm on the Dan River**. A first quantification of the ecological impact of the Trout farm effluent on the Dan River reserve. Submitted to the Nature and Parks Authority (November 2016).
- **Ecological assessment as a supporting tool for river basin management: the southern Jordan and its tributaries as a model.** A 2-year project to develop an aquatic assessment system which is fully compatible with the European methodology for reporting on the ecological status of fluvial ecosystems of the Lower Jordan Valley. Supported by the Landscape Protection Fund of the Israel Land Authority (2017-2019)
- **Ecological assessment of the Dead Sea Oasis wetland and stream nature reserves (Einot Zukim, Nahal David, Nahal Arugot, Ein Bokek).** Hydrobiological survey of the lowest freshwater ecosystems on earth. Supported by the IMEP.
- **Ecological assessment as a supporting tool for river basin management: the Qishon and its tributaries.** Supported by the Kishon River Authority.

THE ENTOMOLOGY LAB FOR ECOLOGICAL MONITORING

Ittai Renan

Arthropods are the most diverse group in terrestrial systems, accounting for over 85% of all known organisms. Arthropods inhabit a tremendous variety of niches across wide spatial scales and exhibit a variety of feeding habits and life forms that form, after the plants, a basis for most terrestrial food webs. Because of their high and fast reproduction rate, arthropod communities are sensitive indicators of short and long term environmental changes. Large numbers of arthropod species and specimens can be efficiently collected. For these reasons the group is utilized as a rich data source for ecological monitoring and ecosystem management.

Current researches in the lab focus on conservation and ecological management questions, utilizing arthropods as a sensitive tool for the assessment of ecological quality and ecosystem response to anthropogenic activities. Assessment includes multivariate analysis of community structure and composition, integrating various ecological indices and experimental approaches. The taxonomic identification is the basis of the analysis in each project. The identifications rely on the access to the reference collections of insects in the Steinhardt Museum of Natural History and national and worldwide experts advice. A large scale arthropod sampling from different sites and seasons, and using various methods, supplements the museum collection with valuable specimens: rare, new to Israel fauna and species new to science.

The lab's activity expands form Ramot Yissakhar in the north to Sedom in south of the Dead Sea. The current projects deal with monitoring arthropod communities in between agricultural and natural landscapes and ecological corridors, providing operational recommendations for rehabilitation management in national parks, estimating impacts of local anthropogenic pressure on sensitive ecological systems and monitoring population of a rear butterfly.

The projects run in collaboration with the Ministry of Environmental Protection, the Ministry of Agricalteure & Rural Development, Israel Nature and Parks Authority, The Society for the Protection of Nature in Israel, Israel's national Ecosystem Management Assessment Program, Ramat Hanadiv, the Open Landscape Institute, Technion – Israel Institute of Technology and regional councils.

This year we ran 12 different research projects, published five reports and presented our studies in the United States at a conference, a seminar talk at the Smithsonian Institution, and one conference in Israel. The lab employs two workers on the half-time basis, another two on third-time and three workers on a pay-per-hour basis.

The Entomology Lab for Ecological Monitoring aims to provide a high resolution tool for understanding ecological systems in order to contribute to the conservation efforts of Israel's biodiversity.

HAMAARAG – ISRAEL'S NATIONAL NATURE ASSESSMENT PROGRAM

Irina Levinsky

Hamaarag—Israel's National Nature Assessment Program—is a consortium of independent scientists and organisations that are responsible for natural resource management in Israel. Our partners include The Ministry of Environmental Protection, The Nature and Parks Authority, the Jewish National Fund (KKL-JNF), with additional financial support from a private fund. In early 2016 Hamaarag moved from under the auspices of Israel Academy of Sciences and Humanities and operates now out of the Steinhardt Museum of Natural History.

Hamaarag's primary mission is to assess the state of nature in Israel for knowledge-based management of open landscapes and biodiversity. We aspire to contribute to the advancement of knowledge-based management of open spaces and natural resources, via continuous production of scientific knowledge on the state of ecosystems and biodiversity in Israel. This knowledge is accessible to decision-makers as well as to the general public.

Our activities include operating long-term programs that are interconnected and mutually supportive.

Main achievements in 2016:

State of Nature report

We published the State of Nature in Israel Report 2016, a document that quantitatively and qualitatively describes the state of nature and its dominant trends. The report is based on information gathered within the framework of programs conducted by Hamaarag and other bodies, and provides an up-to-date and reliable assessment of the state of nature in Israel for decision-makers with respect to open landscapes. The report is available on our website www.hamaarag.org.il (in Hebrew, with an executive summary in English).

Israel National Ecosystem Assessment

A halfway report of the Israel National Ecosystem Assessment project, including key findings, is due to be completed in January 2017. The project is designed to increase the awareness of dependence on functioning ecosystems and their multi-dimensional value. In addition, the project will produce a knowledge base that will assist managers and policy designers in assimilating the value of biodiversity and ecosystem services in the planning and management of Israel's landscapes.

The National Program for Terrestrial Biodiversity Monitoring

We completed a second full-scale monitoring cycle of the National Program for Terrestrial Biodiversity Monitoring. The monitoring program was launched in 2013, and aims to assess the state of Israel's biodiversity and nature and significant changes taking place within them. The program monitors the Israeli flora and fauna on a regular basis through field surveys, surveillance cameras and sensors, and each monitoring cycle lasts for two years.

The program for ecosystem monitoring in Evrona Nature Reserve

We completed the first monitoring year of the effects of the oil spill in Evrona Nature Reserve. The oil spill that occurred in December 2014 was estimated to be one of the most severe environmental disasters that took place in Israel, and serious concerns were raised regarding its long-term damage to the region's unique flora and fauna. The Nature and Parks Authority appointed Hamaarag to coordinate, develop and monitor an assessment of the ecological consequences of the oil leak and the naturally-occurring rehabilitation processes within the ecosystem.

OPEN LANDSCAPE INSTITUTE – ANNUAL SUMMARY FOR 2016/17 AND FORECAST FOR 2017/18

Uri Ramon

The main activities during the past year included:

Nature and Landscape Surveys – Surveys were carried out in the following regions: Lower Jordan Valley, Alonim Hills, Elot Ada forest, Eastern Lower Galilee, Upper Zinn Basin and the Southern Negev. The Institute is a partner in development and implementation of methodology in the following fields: assimilating the value of vacation and leisure into the surveys, examining the possibility of integrating remote sensing, vegetation mapping in desert regions, developing monitoring programs with professionals from HaMaarag and the Nature and Parks Authority, surveys of endangered plant species, and identifying and developing conservation tools for sites with high value for biodiversity conservation (hotspots).

Research – a number of studies and projects concerning environment and agriculture were carried out. Additional studies in progress in this field are detailed below.

In early January 2017 the Institute moved to the Steinhardt Museum of Natural History, Tel-Aviv University. The new location inspires new initiatives and research activities in collaboration with students and faculty members from the Tel Aviv University and other research institutes.

The main challenges that the Institute is facing this year include:

1. Strengthening and expanding our activity in fields defined within the Institute's core practices:
   1.1. Agriculture and environment – developing knowledge, expanding dialog circles, supporting professional and public processes.
   1.2. Ecological and landscape background for planning – conducting and developing methodology for nature, landscape and human heritage surveys.
   1.3. Integrating field surveys and remote sensing to obtain the best outcome for mapping of vegetation and conservation value.
2. Expanding and assimilating outcomes among various target audiences:
   2.1. Developing tools for disseminating knowledge: workshops, instructors and more.
   2.2. Increasing professional and public exposure of the accumulated knowledge: updating the Institute's Website and expanding the mailing list.
3. Strengthening connections and expanding collaboration with the partner organizations in the Open Landscape Institute and colleagues from the Steinhardt Museum of Natural History and academia.
4. Professional and budget strengthening: determining the budgetary basis for the coming years, absorbing new employees and training them to carry out the intended tasks.

Detailed Plans for 2018 – Nature and Landscape Surveys

- **Vegetation monitoring within the National Assessment of the State of Nature (HaMaarag)** – A survey in four additional monitoring units is planned. This year we started to expand the use of high-resolution aerial photographs in the Western Negev dune area. We intend to continue this process in other ecological environments.

- **Survey of endangered plant species** – A survey of the 40 endemic Red Data Book species, defined as high priority, has been completed. The survey will continue next year, and will also include sub-endemic species. A full report of this stage will be issued on 2018.
- **Dead Sea monitoring** – The nature and landscape monitoring unit assists the establishment and monitoring of vegetation in various habitats in the Dead Sea region within the framework of this project. Development of tools and remote sensing integration will proceed in 2018.
- **Hevel Eilot: Southern Arava and Uvda Valley surrounds** – Together with work on a master plan for open landscapes in the Hevel Eilot Regional Council, we are carrying out a nature and landscape survey in areas with higher endemism within the planning region, in which development pressure is stronger. The work is being performed in close collaboration with the planning team and advisors from the council.
- **Alonim Hills and Northern Nazareth Mountains** – This survey is being carried out in a region that exhibits a range of preserved vegetation landscapes such as open forests of gall oak, which are threatened by strong development pressure from both settlement and infrastructure. The survey area will expand in 2018 to include Bikat Turan and Yiftahel stream.
- **Basalt plateaus of the Eastern Lower Galilee** – A region with expansive open landscapes, which are only partly protected. The survey is being carried out along with preparation of master plans for the open landscapes of the regional councils in this area.
- **Negev Highlands: Upper Zin Basin** – Together with work on a master plan for open landscapes by the Negev Highlands Regional Council, a nature and landscapes survey is also taking place, which will include large parts of the upper section of the Zin River Basin, as well as relatively small areas of the Ro'ah River and Boker River basins.
- **Elot Ada forest** – The botanical survey was completed in 2017. Zoological surveys will be conducted in collaboration with local community and the KKL-JNF staff in 2018.
- **Eastern Wadi Ara –** A landscape survey will be conducted in 2018, to support the planning process in this region.
- **Harod valley –** An ecological survey will be delivered in 2018.

Detailed Research Plans for 2018

- **Identifying critical sites for nature conservation in Israel: 'Hotspots'** – this project is designed to locate, map and classify sites with great importance for biodiversity in Israel, and to describe their state and existing threats to them as a basis for advancing conservation efforts to protect assiciated natural values. The project will continue in 2018.
- **Agricultural practices, which support biodiversity and suit Israel** – this project is designed to identify agricultural practices that support biodiversity and are relevant to Israel in terms of her climat, agricultural crops and farm structure. The first part of the project analyzing the Mediterranean climate zones was completed in 2017. The project was presented at a number of Israeli and international scientific conferences. The second part of the project dealing with desert and arid zones will be completed in 2018.
- **Developing a guide for farmers: agricultural practices supporting biodiversity** – preparing an implementation guide for farmers, who are interested in encouraging biodiversity on their farms. Distribution of the guide through relevant communication channels. The project will continue in 2018.
- **Developing a methodology for surveying agricultural landscapes as part of nature and landscape surveys** – examining and experimenting with methods for estimating the importance of agricultural landscapes, with different spatial and farming characteristics, for biodiversity conservation. A draft of the project's final report was completed on 2017 to be presented to a panel of experts in January 2018.

- **Vacation and leisure in open landscapes of the Lev HaSharon Regional Council** – this project examines the economic benefits of ecological projects with respect to tourism and local businesses, and the ability to integrate biodiversity conservation with tourism. The project will continue in 2018.
- **Monitoring pesticides in the atmosphere as a basis for agreements in the agriculture–community interface** – this research examines trends in the distribution of pesticides in the atmosphere in order to derive conclusions about coordinating spraying times near residential areas. The project was completed in 2017, and was presented in a number of scientific conferences.
- **Environmental branding of agricultural products –** together with the Program for Social Economists and the Ministry of Agriculture. A workshop for 5 excellent undergraduate economy students of the Tel Aviv University, which aims to examine the feasibility of translating agri-environmental actions into added value to farm products.
- **Think tank for environmentally-friendly agriculture** – this think tank brings together academics, decision-makers and farmers to discuss aspects of agricultural practice and biodiversity.

CHAPTERS IN THE HISTORY OF THE NATIONAL COLLECTIONS OF NATURAL HISTORY OF TEL AVIV UNIVERSITY: THE MOLLUSC COLLECTION OF ABRAHAM SINGER 1923-2016

Henk K. Mienis

Abraham, or Avram as he was called, was born on 11 May 1923 in Hungary to Helena and Eliezer Singer. As a youngster at the age of 16 he left his family and Hungary for Palestine, at that moment under British Mandate. With the outbreak of WW2 he enlisted in the Jewish brigade of the British Army and served initially in North Africa and later on in Europe. After the war he returned to Palestine, joined Palmach and fought in Israel's War of Independence (Singer, 2016). In his civil life he became the owner of a garage.

In 1960 Avram travelled to Ethiopia (which included Eritrea at that time) and returned with a large collection of sea shells from the southern part of the Red Sea. This was the beginning of his interest in molluscs especially those of the Red Sea. On numerous occasions he went to Sinai and by means of beach combing, snorkeling and finally scuba diving he enlarged slowly but steadily his collection. Always he noted carefully where and when the shells were collected.

At an early stage he became a member of the Israel Malacological Society, which was established in 1969. Although he never became actively involved in running the Society, he was always willing to share his knowledge with other collectors and provided useful information for scientific articles.

In the later years of his life he started to reducegradually the size of his collection. Part of the scientific collection became the property of his son Yoav Singer, daughter Irit Kassif-Singer and several other family members. Most of that material is still accompanied with his labels.

Avram passed away on 26 Sepember 2016. Irit published a small album in his memory showing some of the more colourful and impressive shells from Abraham's collection.

An extensive exchange collection was bequeathed to his granddaughter Maya Avisar-Kassif, who together with her husband Amos Avisar eventually donated it to the Steinhardt Museum of Natural History. In this way a promise of Avram to the Israel Nature Parks Authority was implemented: at least part of his collection was donated to a scientific institute.

That part of Avram's legacy will be incorporated in the general mollusc collection as soon as his material is transferred to the new museum. It will form a permanent memory to the collecting activities of "Saba Yam" [Grandad Sea] as he was known among his grand- and great-grandchildren.

Malacological publications of Abraham Singer

Abraham Singer (co)authored 15 short malacological publications listed below in chronological order.

[Singer, A.], 1973. Is this a record size? *Hawaiian Shell News*, 21 (6) [=NS 162]: 5.

[Singer, A.] Leehman, E., 1973. *Murex* from Aqaba. *Hawaiian Shell News*, 21 (8) [=NS 164]: 3.

[Singer, A.], 1973. Little stranger. *Hawaiian Shell News*, 21 (12) [=NS 168]: 9.

Heiman, E.L. and Singer, A., 2008. New pink form of *Erosaria turdus pardalina* (Dunker, 1852). *Triton*, 17: 25.

Singer, A. and Kovalis, M., 2009. Interesting shells. *Triton*, 19: 43-44.

Singer, A, 2010. Unusual find in Elat. *Triton*, 21: 40.

Heiman, E.L. and Singer, A., 2013. Uncommonly pigmented forms of *Mauritia arabica grayana*. *Triton*, 27: 16.

Holtzer, E., and Singer, A., 2013. Interesting shells. *Triton*, 27: 31-32.

Heiman, E.L. and Singer, A., 2013. Shell variability in *Erosaria turdus*: an albinotic form. *Triton*, 28: 19.

Heiman, E.L. and Singer, A., 2013. Shell variability in *Erosaria turdus pardalina*: a near round shell shape. *Triton*, 28: 20.

Heiman, E.L. and Singer, A., 2013. Shell variability in *Erosaria turdus pardalina*: a near rhomboic shell shape. *Triton*, 28: 21.

Heiman, E.L. and Singer, A., 2013. Variability in *Erosaria turdus pardalina*: the dorsal line. *Triton*, 28: 22.

Heiman, E.L. and Singer, A., 2013. Shells variation in *Erosaria turdus*: a form 'albocincta'. *Triton*, 28: 23.

Heiman, E.L. and Singer, A., 2013. More on a form saturated of *Erosaria turdus pardalina*. *Triton*, 28: 24.

Heiman, E.L. and Singer. A., 2014. More on shell variation in *Erosaria turdus pardalina*. *Triton*, 29: 7-11.

Eponyms honouring Abraham Singer

His involvement in the study of molluscs will be remembered by the two taxa which are named in his honour:

Spondylus avramsingeri Kovalis, 2010

Erosaria turdus singer Heiman, 2014

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References

Heiman, E.L., 2014. *Erosaria turdus singeri*, a new subspecies. *Triton*, 29: 12-14.

[Kassif-Singer, I.], 2016. [Abraham Singer – the Man and the Sea: 11.5.1923 – 26.9.2016.] Privately published. [in Hebrew]

Kovalis, M., 2010. *Spondylus avramsingeri*: a new species from the Red Sea. *Gloria Maris*, 49 (3-4): 54-62.

Mienis, H.K., 2016. Malacological publications of Abraham Singer and eponyms in his honor. *Triton*, 34: 1-2.

Singer, B.S., 2016. The end of an era Abraham Singer, ardent shell collecter, is no more. *Triton*, 34: 1.

PUBLICATIONS

The Steinhardt Museum of Natural History is an important research infrastructure, used by scientists within and outside of the university. Here we list the 2016/2017 publications, that includes all publications of TAU members affiliated with the collections (whether they are directly collections-based or not). It underrepresents publications of individuals from other institutions, since our follow-up is far from complete.

Refereed articles

5. Abelson, A., Nelson, P.A., Edgar, G.J., Shashar, N., Reed, D.C., Belmaker, J., Krause, G., Beck, M.W., Brokovich, E., France, R. & Gaines, S.D. (2016) Expanding marine protected areas to include degraded coral reefs. *Conservation Biology*, 30, 1182–1191.
6. Adar, S. & Dor, R. (2018) Mother doesn't always know best: Maternal wormlion choice of oviposition habitat does not match larval habitat choice. *Behavioral Processes*, 147: 1–4.
7. Adar, S., Dor, R. & Scharf, I. (2016) Habitat choice and complex decision making in a trapbuilding predator. *Behavioral Ecology*, 27, 1491–1498.
8. Adar, S., Scharf, I. & Dor, R. (2016) The effect of previous experience on trap construction and movement distance in a pit-building predator. *Science of Nature*, 103, 83.
9. Akron, A., Ghermandi, A., Dayan, T. & Hershkovitz, Y. (2017) Interbasin water transfer for the rehabilitation of a transboundary Mediterranean stream: An economic analysis. *Journal of Environmental Management*, 202, 276–286.
10. Alamaru, A., Hoeksema, B.W., van der Meij, S.E.T. & Huchon, D. (2017) Molecular diversity of benthic ctenophores (Coeloplanidae). *Scientific Reports*, 7, Art. 6365.
11. Alex, B., Barzilai, O., Hershkovitz, I., Marder, O., Berna, F., Caracuta, V., Abulafia, T., Davis, L., Goder-Goldberger, M., Lavi, R., Mintz, E., Regev, L., Bar-Yosef Mayer, D., Tejero, J.M., Yeshurun, R., Ayalon, A., Bar-Matthews, M., Yasur, G., Frumkin, A., Latimer, B., Hans, M.G. & Boaretto, E. (2017) Radiocarbon chronology of Manot Cave, Israel and Upper Paleolithic dispersals. *Science Advance*, 3(11), e1701450.
12. Amat, F. & Meiri, S. (2017). Geographic, climatic and biological constraints on the age at sexual maturity in amphibians. *Biological Journal of the Linnean Society*, 123(1), 34–42.
13. Ashkenazi, D., Cvikel, D., Langgut, D., Rosen, B. & Galili, E. (2017) Artillery and rigging artefacts from the Megadim wreck-site, Israel. *Journal of Archaeological Science: Reports*, 13, 1–16.
14. Azzurro, E., Maynou, F., Belmaker, J., Golani, D. & Crooks, J.A. (2016) Lag times in Lessepsian fish invasion. *Biological invasions*, 18(10), 2761–2772.
15. Baar, Y., Friedman, A.L.L., Meiri, S. & Scharf, I. (2017) Little effect of climate change on body size of herbivorous beetles. *Insect Science*. http://doi.org/10.1111/1744-7917.12420.
16. Baranes, A., Stern, N. & Goren M. (2017) First record of *Pristipomoides multidens* (Day, 1871) from the Gulf of Aqaba, with a note on the species of *Pristipomoides* in the Red Sea (Actinopterygii: Lutjanidae). *Zoology in the Middle East*, 63(2), 136–140.
17. Barkae, E.D., Scharf, I. & Ovadia, O. (2017) A stranger is tastier than a neighbor: Cannibalism in Mediterranean and desert populations of pit-building antlions. *Behavioral Ecology*, 28, 69–76.

18. Barkae, E.D., Scharf, I. & Ovadia, O. (2017). Differential effects of variance in prey arrival on foraging success and growth rate of two pit-building antlion species. *Journal of Zoology*, 303(4), 254–260

19. Bar-Massada, A. & Belmaker, J. (2017) Non-stationarity in the co-occurrence patterns of species across environmental gradients. *Journal of Ecology*, 105, 391–399.

20. Baruch, O., Mendel, Z., Scharf, I. & Harari, A.R. (2017) Mating system, mate choice and parental care in a bark beetle. *Bulletin of Entomological Research*, 107, 611–619.

21. Bar-Yosef Mayer, D.E. (2017) Shell beads in Neolithic sites in Turkey. *The Archaeo+Malacology Group Newsletter*, 28, 1–4.

22. Bar-Yosef Mayer, D.E. (2017) Türkiye'deki Neolitik yerleşim alanlarında bulunan kabuk boncuklar. *Bilim ve Utopya*, May 2017, 44–46.

23. Bar-Yosef Mayer, D.E. (2018) Shell ornaments and artifacts in Neolithic *Cyprus* and correlations with other Mediterranean regions. *Quaternary International*, 464 (A), 206–215. http://dx.doi.org/10.1016/j.quaint.2017.06.034

24. Beermann, A.J., Uekötter, L., Leese, F., Lorenz, A.W. & Hershkovitz, Y. (2017) Insights into species diversity of the genus *Hydropsyche* Pictet, 1834 (Hydropsychidae, Trichoptera) from the Lake Kinneret catchment (Israel). *Aquatic Insects*, 38(3), 125–140.

25. Ben Yosef, E., Langgut, D. & Sapir-Hen, L. (2017) Beyond smelting: New insights on Iron Age (10th c. BCE) Metalworkers community from excavations at a gatehouse and associated livestock pens in Timna, Israel. *Journal of Archaeological Science: Reports*, 11, 411–426.

26. Ben-Ami, F. (2017) The virulence-transmission relationship in an obligate killer holds under diverse epidemiological and ecological conditions, but where is the trade-off? *Ecology and Evolution*, 7, 11157–11166.

27. Ben-Cohen, S. & Dor, R. (2018) Phenotypic divergence despite low genetic differentiation in house sparrow populations. *Scientific Reports*, 8, Art. 394. https://doi.org/10.1038/s41598-017-18718-8

28. Boyadzhiev, P.S., Yefremova, Z., Tozlu, G., Mergen, Y.O. & Mete, O. (2017) Description of *Stepanovia fructirosae* sp. n. (Hymenoptera, Chalcidoidea, Eulophidae) from Turkey. *Acta zoologica Bulgarica*, Suppl. 8, 113–117.

29. Brink, E.C.M. van, Barzilai, O., Vardi, J., Cohen-Weinberger, A., Lernau, O., Liphschitz, N., Bonani, G., Mienis, H.K., Rosenberg, D., Tzin, B., Katina, A., Shalev, S., Shilstein, S. & Horwitz, L.K. (2016) Late Chalcolithic settlement remains east of Namir Road, Tel Aviv. *Journal of the Israel Prehistoric Society* [*Mitekufat HaEven*], 46, 20–121.

30. Bronstein, O., Kroh, A. & Loya, Y. (2016) Reproduction of the long-spined sea urchin *Diadema setosum* in the Gulf of Aqaba – implications of the use of gonad-indexes. *Scientific Reports*, 6, Art. 29569. http://dx.doi.org/10.1038/srep29569

31. Brown, S., Soroker, V. & Ribak, G. (2017) Effect of larval growth conditions on adult body mass and long-distance flight endurance in a wood-boring beetle: Do smaller beetles fly better? *Journal of Insect Physiology*, 98, 327–335.

32. Buba, Y., van Rijn, I., Blowes, S., Sonin, O., Edelist, D., DeLong, J.P. & Belmaker, J. (2017). Remarkable size-spectra stability in a marine system undergoing massive invasion. *Biology Letters*, 13, Art. 20170159. http://dx.doi.org/10.1098/rsbl.2017.0159

33. Carmel, Y., Suprunenko, Y.F., Kunin, W.E., Kent, R., Belmaker, J., Bar-Massada, A. & Cornell, S.J. (2017). Using exclusion rate to unify niche and neutral perspectives on coexistence. *Oikos*, 126(10), 1451–1458.

34. China, V., Levi, L., Elmaliach, T., Liberzon, A. & Holzman, R. (2017) Hydrodynamic regime affects feeding success and encounter rates with prey to determine feeding rates of larval fish during the critical period. *Proceedings of the Royal Society B: Biological Sciences*, 284, Art. 20170235. http://dx.doi.org/10.1098/rspb.2017.0235

35. Clark, S.M., Terry, T.J. & Furth, D.G. (2017) The first report of *Lupraea elongata* (Jacoby, 1891) (Coleoptera: Chrysomelidae: Galerucinae: Alticini) from the USA. *The Coleopterists Bulletin*, 71(2), 351–356.

36. Cohen, H., Kugel, C., May, H., Medlej, B., Stein, D., Slon, V., Brosh, T. & Hershkovitz, I. (2017) The influence of impact direction and axial loading on the bone fracture pattern. *Forensic Science International*, 277, 197–206.

37. Cohen, H., Kugel, C., Slon, V., May, H., Medlej, B., Stein, D., Brosh, T. & Hershkovitz, I. (2017) The effect of impact tool geometry and soft material covering on long bone fracture patterns in children. *International Journal of Legal Medicine*, 131(4), 1011-1021.

38. Comay, O. & Dayan, T. (2018). Taphonomic signatures of owls: new insights into micromammal assemblages. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 492, 81–91.

39. Corrales, X., Coll, M., Ofir, E., Piroddi, C., Goren, M., Edelist, D., Heymans, J.J., Steenbeek, J., Christensen, V. & Gal, G. (2017) Hindcasting the dynamics of an Eastern Mediterranean marine ecosystem under the impacts of multiple stressors. *Marine Ecology Progress series*, 580, 17–36.

40. Corrales, X., Ofir, E., Coll, M., Goren, M., Edelist, D., Heymans, J.J. & Gal, G. (2017) Modeling the role and impact of invasive species and fisheries on the Israeli marine continental shelf ecosystem. *Journal of Marine Systems*, 170, 88–102.

41. Cummings, D., Goren, M., Gasith, A. & Zohary, T. (2017) Inundated shore vegetation as habitat for cichlids breeding in a lake subjected to extreme water level fluctuations. *Inland Waters*, 7(4), 449–460.

42. Dagan, Y., Kosman, E. & Ben-Ami, F. (2017) Cost of resistance to trematodes in freshwater snail populations with low clonal diversity. *BMC Ecology*, 17, Art 40. https://doi.org/10.1186/s12898-017-0152-x

43. Danon, G., Ben-Shlomo, R., Keidar, N. & Dorchin, N. (2017) Geographic and behavioral isolation promote the differentiation of parapatric host forms in bud-galling midges. *Biological Journal of the Linnean Society*, 121, 163–173.

44. Darling, J.A., Galil, B.S., Carvalho, G.R., Rius, M., Viard, F. & Piraino, S. (2017) Recommendations for developing and applying molecular genetic tools to assess and manage biological invasions in marine ecosystems. *Marine Policy*, 85, 54–64.

45. Demartsev, V., Ilany, A., Kershenbaum, A., Geva, Y., Margalit, O., Shnitser, I., Barocas, A., Bar-Ziv, E., Koren, L. & Geffen, E. (2017) The progression pattern of male hyrax songs and the role of climactic ending. *Scientific Reports*, 7, Art. 2794. https://doi.org/10.1038/s41598-017-03035-x

46. Ebert, D., Duneau, D., Hall, M.D., Luijckx, P., Andras, J.P., Du Pasquier, L. & Ben-Ami, F. (2016) A population biology perspective on the stepwise infection process of the bacterial pathogen *Pasteuria ramosa* in *Daphnia Advances in Parasitology*, 91, 265–310.

47. Ermolaev, I.V., Yefremova, Z.A. & Koroleva, A.E. (2017) Are parasitoids a mortality factor for the lime lifeminer in Moscow province? *In*: *XV Congress of the Russian Entomological Society*. July 31–August 7, 2017, Novosibirsk, Russia. Materials of Congress, pp. 178–179.

48. Evans, J.S., Erwin, P.M., Shenkar, N. & López-Legentil, S. (2017) Introduced ascidians harbor highly diverse and host-specific symbiotic microbial assemblages. *Scientific Reports*, 7, Art. 11033. https://doi.org/10.1038/s41598-017-11441-4

49. Eyal, G., Eyal-Shaham, L., Cohen, I., Tamir, R., Ben-Zvi, O., Sinniger-Harii, F. & Loya, Y. (2016) *Euphyllia paradivisa*: A successful mesophotic coral in the northern Gulf of Eilat/Aqaba, Red Sea. *Coral Reefs*, 35, 91–102.

50. Eyal-Shaham, L., Eyal, G., Tamir, R. & Loya, Y. (2016) Reproduction, abundance and survivorship of two *Alveopora* spp. in the mesophotic reefs of Eilat, Red Sea. *Scientific Reports*, 6, Art. 20964. https://doi.org/10.1038/srep20964

51. Faust, A., Katz, H., Sapir, Y., Avraham, A., Marder, O., Bar-Oz, G., Weiss, E., Auman-Chazan, C., Hartmann-Shenkman, A., Sadiel, T., Vilnay, O., Tsesarsky, M., Sarah, P., Ackermann, O., Timmer, N., Katz, O., Langgut, D. & Benzaquen, M. (2017) The Birth, Life and Death of an Iron Age House at Tel 'Eton, Israel. *Levant*, 49, 136–173.

52. Feldman, B., Shlesinger, T. & Loya, Y. (2017) Mesophotic coral-reef environments depress the reproduction of the coral *Paramontastraea peresi* in the Red Sea. *Coral Reefs*, 37, 201–214. https://doi.org/10.1007/s00338-017-1648-8

53. Feldman, M., Hershkovitz, I., Sklan, E.H., Bar-Gal, G.K., Pap, I., Szikossy, I. & Rosin-Arbesfeld, R. (2016) Detection of a tumor suppressor gene variant predisposing to colorectal cancer in an 18th century Hungarian mummy. *PLoS One*, 11(2), Art. e0147217. https://doi.org/10.1371/journal.pone.0147217

54. Fet, V., Soleglad, M. & Zonstein, S. (2017) The second record of a relict *Akrav israchanani* Levy, 2007 (Scorpiones: Akravidae) from Levana Cave, Israel. *Euscorpius*, 247, 1–12.

55. Finkelstein, I., Langgut, D., Meiri, M. & Sapir-Hen, L. (2017). Egyptian imperial economy in Canaan: Reaction to the climate crisis at the end of the Late Bronze Age. *Egypt and the Levant*, 27, 249–259.

56. Fornai, C., Benazzi, S., Gopher, A., Barkai, R., Sarig, R., Bookstein, F.L., Hershkovitz, I. & Weber, G.W. (2016) The Qesem Cave hominin material (part 2): A morphometric analysis of dm2-QC2 deciduous lower second molar. *Quaternary International*, 398, 175–189.

57. Friedman, A.L.L. (2017) The first record of the Azolla frond weevil *Stenopelmus rufinasus* (Curculionidae: Brachycerinae: Tanysphyrini) in Israel. *Israel Journal of Entomology*, 47, 103–106.

58. Friedman, A.L.L. (2017) The genus *Sharpia* Tournier in Israel (Coleoptera: Curculionidae, Curculioninae). *Israel Journal of Entomology*, 47, 159–172.

59. Furth, D.G. (2017) New record and redescription of *Phyllotreta buettikeri* Doguet (Coleoptera: Chrysomelidae: Alticinae). *Entomologische Blätter und Coleoptera*, 113(1), 83–87.

60. Furth, D.G. (2017) Recent advances in the knowledge of Mexican Alticinae (Coleoptera: Chrysomelidae). *ZooKeys*, 720, 23–46.

61. Gainsbury, A. & Meiri, S. (2017) Latitudinal diversity gradient and interspecific competition: no global relationship between lizard dietary niche breadth and species richness. *Global Ecology and Biogeography*, 26, 563–572.

62. Galil, B.S., Marchini, A., Occhipinti-Ambrogi, A. & Ojaveer, H. (2017) The enlargement of the Suez Canal – Erythraean introductions and management challenges. *Management of Biological Invasions*, 8(2), 141–152.

63. Galil, B.S., Levitt-Barmats, Y., Lubinevsky, H., Yudkovski, Y., Paz, G. & Rinkevich, B. (2017) A record of *Arcania brevifrons* Chen, 1989 (Crustacea; Decapoda; Leucosiidae) from the Mediterranean coast of Israel. *Bioinvasion Records*, 6(3), 249–253.

64. Galil, B.S., Douek, J., Mienis, H.K. & Rinkevich, B. (2016) Comments on "The Mediterranean Sea as a gateway for invasion of the Red Sea: the case of the Indo-West Pacific head-shield slug *Chelidonura fulvipunctata* Baba, 1938" by Manuel António E. Malaquias, Andrea Zamora-Silva, Dyana Vitale, Andrea Spinelli, Sergio De Matteo, Salvatore Giacobbe, Deneb Ortigosa and Juan L. Cervera. *Aquatic Invasions*, 11(4), 351–354.

65. Gavriilidi, I.A., Schwarz, R., Meiri, S. & Pafilis, P. (2017) *Hellenolacerta graeca* (Bedriaga, 1886), from xeric habitats in the south Peloponnese: ecological implications. *Herpetozoa*, 29, 202–204.

66. Gewing, M., López-Legentil, S. & Shenkar, N. (2017) Anthropogenic factors influencing invasive ascidian establishment in natural environments. *Marine Environmental Research*, 131, 236–242.

67. Geyzner, A., Rothman, S. & Mienis, H.K. (2017) An encounter with the pelagic nudibranch *Phylliroe bucephala* off Akhziv, Israel (Mollusca, Gastropoda, Phylliroidae). *Triton*, 35, 11–12.

68. Gilaad, R.L., Galil, B.S., Diamant, A. & Goren, M. (2017) The diet of native and invasive fish species along the eastern Mediterranean coast (Osteichthyes). *Zoology in the Middle East*, 63(4), 325–335.

69. Givan, O., Edelist, D., Sonin, O. & Belmaker, J. (2018). Thermal affinity as the dominant factor changing Mediterranean fish abundances. *Global Change Biology*, 24(1), e80–e89.

70. Givan, O., Parravicini, V., Kulbicki, M. & Belmaker, J. (2017) Trait structure reveals the processes underlying fish establishment in the Mediterranean. *Global Ecology and Biogeography*, 26, 142–153.

71. Glatstein, M., Adir, D., Galil, B., Scolnik, D., Rimon, A., Pivko-Levy, D. & Hoyte, Ch. (2017) Pediatric envenomation by *Rhopilema nomadica* jellyfish in the Mediterranean Sea. *European Journal of Emergency Medicine*. https://doi.org/10.1097/MEJ.0000000000000479.

72. Goldberg, S.R., Bursey, C.R., Schwarz, R., Jamison, S. & Maza, E. (2017) *Platyceps rogersi* (Rogers' racer). Endoparasites. *Herpetological Review*, 48, 218.

73. Goldberg, S.R., Bursey, C.R., Tallowin, O., Itescu, Y. & Maza, E. (2017) *Hemorrhois nummifer* (Asian racer). Endoparasites. *Herpetological Review*, 48, 213.

74. Goll, Y., Demartsev, V., Koren, L. & Geffen, E. (2017) Male hyraxes increase countersinging as strangers become 'nasty neighbours'. *Animal Behaviour*, 134, 9–14.

75. Goren, L. & Ben-Ami, F. (2017) To eat or not to eat infected food: a bug's dilemma. *Hydrobiologia*, 798, 25–32.

76. Goren, L. Shefer, S. & Feldstein, T. (2017) First record of the Indo-Pacific species Iphione muricata Savigny in Lamarck, 1818 (Polychaeta: Iphionidae) from the Mediterranean Sea, Israel. *Mediterranean Marine Science*, 18(1), 134–137.

77. Goulet, C., Ingley, S., Scharf, I. & Pruitt, J.N. (2016) Thermal effects on survival and reproductive performance vary according to personality type. *Behavioral Ecology*, 27, 1635–1641.

78. Granot, I., Shenkar, N. & Belmaker, J. (2017) Habitat niche breadth predicts invasiveness in solitary ascidians. *Ecology and Evolution*, 7, 7838–7847.

79. Guarnieri, G., Fraschetti, S., Bogi, C. & Galil, B.S. (2017) A hazardous place to live: spatial and temporal patterns of species introduction in a hot spot of biological invasions. *Biological Invasions*, 19(8), 2277–2290.

80. Haran, J., Schütte, A. & Friedman, A.L.L. (2017) A review of *Smicronyx* Schoenherr (Coleoptera, Curculionidae) of Israel, with description of two new species. *Zootaxa*, 4237(1), 17–40.

81. Haran, J., Stüben, P.E. & Friedman, A.L.L. (2017) An illustrated key of the *Smicronyx* of Israel (Coleoptera: Curculionidae: Smicronychini). *Snudebiller: Studies on taxonomy, biology and ecology of Curculionoidea*, 18(262) 1–4.

82. Hardy, K., Radini, A., Buckley, S., Sarig, R., Copeland, L., Gopher, A. & Barkai, R. (2016) Dental calculus reveals potential respiratory irritants and ingestion of essential plant-based nutrients at Lower Palaeolithic Qesem Cave Israel. *Quaternary International*, 398, 129–135. https://doi.org/10.1016/j.quaint.2015.04.033

83. Hershkovitz, Y., Hering, D., Gal, G., Pottgiesser, T. & Feld, C.K. (2017) Stream types of the lake Kinneret (Sea of Galilee) watershed. *International Journal of River Basin Management*. https://doi.org/10.1080/15715124.2017.1365722

84. Hershkovitz, I., Latimer, B., Barzilai, O. & Marder, O. (2017) Manot 1 calvaria and Recent Modern Human Evolution: An Anthropological Perspective. *Bulletin Memoire Société d'Anthropologie de Paris*, 29, 119–130.

85. Hershkovitz, I., Weber, G.W., Fornai, C., Gopher, A., Barkai, R., Slon, V., Quam, R., Gabet, Y. & Sarig, R. (2016) New Middle Pleistocene dental remains from Qesem Cave (Israel). *Quaternary International*, 398, 148–158.

86. Hoffman, R., Wynne, M.J., Schils, T., Lopez-Bautista, J. & Verbruggen, H. (2018). *Codium pulvinatum* (Bryopsidales, Chlorophyta), a new species from the Arabian Sea, recently introduced into the Mediterranean Sea. *Phycologia*, 57(1), 79–89.

87. Holzman, R. & Hulsey, C.D. (2017) Mechanical transgressive segregation and the rapid origin of trophic novelty. *Scientific Reports*, 7, Art. 40306. https://doi.org/10.1038/srep40306

88. Ingley, S.J., Pruitt, J.N., Scharf, I. & Purcell, J. (2016) Social context, but not individual personality, alters immigrant viability in a spider with mixed social structure. *Animal Behaviour*, 120, 153–161.

89. Innocenti, G., Stasolla, G., Goren, M., Stern, N., Levitt-Barmats, Y., Diamant, A. & Galil, B. (2017) Going down together: invasive host, *Charybdis longicollis* (Leene, 1938) (Decapoda: Brachyura: Portunidae) and invasive parasite, *Heterosaccus dollfusi* Boschma, 1960 (Cirripedia: Rhizocephala: Sacculinidae) on the upper slope off the Mediterranean coast of Israel. *Marine Biology Research*, 13(2), 229–236.

90. Innocenti, G., Stasolla, G., Mendelson, M. & Galil, B.S. (2017) Aggressive, omnivorous, invasive: the Erythraean moon crab *Matuta victor* (Fabricius, 1781) (Crustacea: Decapoda: Matutidae) in the eastern Mediterranean sea. *Journal of Natural History*, 35–36, 2133–2142.

91. Itescu, I., Schwarz, R., Meiri, S. & Pafilis, P. (2017) Intra-specific competition, not predation, drives lizard tail loss on islands. *Journal of Animal Ecology*, 86, 66–74.

92. Itescu, Y., Jamison, S., Slavenko, A., Tamar, K., Roussos, S.A., Foufopoulos, J., Meiri, S. & Pafilis, P. (2017) The herpetofauna of Folegandros Island (Cyclades, Greece). *Herpetozoa*, 29, 183–190.

93. Jacobi, Y., Yahel, G. & Shenkar, N. (2017) Efficient filtration of micron and submicron particles by ascidians from oligotrophic waters. *Limnology and Oceanography*. https://doi.org/10.1002/lno.10736.

94. Jamison, S., Tamar, K., Slavenko, A. & Meiri, S. (2017) *Tarentola annularis* (Squamata: Phyllodactylidae): a new invasive species in Israel. *Salamandra*, 53, 299–303.

95. Janssens, L., Verhaert, L., Berkowic, D. & Adriaens, D. (2017) A standardized framework for examination of oral lesions in wolf skulls (Carnivora: Canidae: *Canis lupus*). *Journal of Mammalogy*, 97(4), 1111–1124.

96. Karagkouni, M., Sfenthourakis, S. & Meiri, S. (2017) The Island Rule is not valid in terrestrial isopods (Crustacea: Oniscidea). *Journal of Zoology*, 301, 11–16.

97. Karahan, A., Douek, J., Paz, G., Stern, N., Kideys, A.K., Shaish, L., Goren, M. & Rinkevich, B. (2017) Employing DNA barcoding as taxonomy and conservation tools for fish species censuses at the southeastern Mediterranean, a hot-spot area for biological invasion. *Journal for Nature Conservation*, 36, 1–9.

98. Karameta, E., Gourgouliani, N., Kouvari-Gaglia, D., Litsi-Mizan, V., Halle, S., Meiri, S., Sfenthourakis, S. & Pafilis, P. (2017) Environment shapes the digestive performance in a Mediterranean lizard. *Biological Journal of the Linnean Society*, 121, 883–893.

99. Katz, N., Pruitt, J.N. & Scharf, I. (2017) The complex effect of illumination, temperature, and thermal acclimation on habitat choice and foraging behavior of a pit-building wormlion. *Behavioral Ecology & Sociobiology*, 71, Art. 137. https://doi.org/10.1007/s00265-017-2362-9

100. Katz, N., Shavit, R., Pruitt, J.N. & Scharf, I. (2017) Group dynamics and relocation decisions of a trap-building predator are differentially affected by biotic and abiotic factors. *Current Zoology*, 63(6), 647–655.

101. Katz, N., Subach, A., Pruitt, J.N. & Scharf, I. (2016) Habitat preference of wormlions and their behavioral repeatability under illumination/shade conditions. *Ecological Entomology*, 41, 716–726.

102. Keiser, C.N., Ingley, S., Toscano, B., Scharf, I. & Pruitt, J.N. (2018). Habitat complexity dampens selection on prey personality. *Ethology*, 124(1), 25–32.

103. Keren, R., Mayzel, B., Lavy, A., Polishchuk, I., Levy, D., Fakra, S.C., Pokroy, B. & Ilan, M. (2017) Sponge-associated bacteria mineralize arsenic and barium on intracellular vesicles. *Nature Communications*, 8, Art. 14393. https://doi.org/10.1038/ncomms14393

104. Kisilevitz, S., Turgeman-Yaffe, Z., Ben-Ari, N., Ilan, D., Marom, N., Weisbrod, L., Nagar, Y. & Langgut, D. (2017) New insights into burial customs during the Middle Bronze Age in the Jerusalem region, in light of recent excavations at the Manaḥat Spur. *New Studies in the Archaeology of Jerusalem and its Region*, 11, 38–63.

105. Kolyada, V. & Mostovski, M.B. (2017) Revision of the genus *Hormoserphus* Townes, 1981 (Hymenoptera: Proctotrupidae), with description of *Trachyserphus* gen. n. and a new species. *Zootaxa*, 4254(5), 575–583.

106. Kravchenko, V.D., Friedman, A.L.L. & Müller, G.C. (2017) The Anti-Lebanon ridge as the edge of the distribution range for Euro-Siberian and Irano-Turanian faunistic elements in the Mediterranean biome: A case study (Lepidoptera: Noctuidae). *SHILAP Revista de Lepidopterología*, 45(180), 639–650.

107. Langgut, D. (2018). Late Quaternary Nile flows as recorded in the Levantine Basin: The palynological evidence. *Quaternary International*, 464(A), 273–284.

108. Langgut, D. (2017) The Citrus route revealed: from Southeast Asia into the Mediterranean. *HortScience*, 52, 814–822.

109. Langgut, D. & Lipschits, O. (2017). Dry climate during the Babylonian and the Early Persian period and its impact on the creation of Idumea. *Transeuphraténe*, 49, 141–172.

110. Langgut, D., Yahalom-Mack, N., Lev-Yadun, S., Kremer, E., Ullman, M. & Davidovich, U. (2017) On Chalcolithic maceheads and spinning implements. *Antiquity*, 91, 777–782.

111. Lavy, A., Keren, R., Yu, K., Thomas, B.C., Alvarez-Cohen, L., Banfield, J.F. & Ilan, M. (2018). A novel Chromatiales bacterium is a potential sulfide oxidizer in multiple orders of marine sponges. *Environmental Microbiology*, 20(2), 800–814.

112. Levy, O., Dayan, T. & Kronfeld-Schor, N. (2017) Time as an ecological resource: can diurnal animals compensate for climate change by nocturnal activity? *Integrative and Comparative Biology*, 57(suppl. 1), 140.

113. Levitt-Barmats, Y. & Shenkar, N. (2018) Observations on the symbiotic relationship between the caridean shrimp *Odontonia sibogae* (Bruce, 1972) and its ascidian host *Herdmania momus* (Savigny, 1816). *PLoS One*, 13(2), Art. e0192045. https://doi.org/10.1371/journal.pone.0192045

114. Lewin, A., Feldman, A., Bauer, A.M., Belmaker, J., Broadley, D.G., Chirio, L., Itescu, Y., LeBreton, M., Maza, E., Meirte, D., Nagy, Z.T., Novosolov, M., Roll, U., Tallowin, O., Trape, O.J., Vidan, E. & Meiri, S. (2016) Patterns of species richness, endemism and environmental gradients of African reptiles. *Journal of Biogeography*, 43, 2380–2390.

115. Lewis, J.P., Leng, M.J., Dean, J.R., Marciniak, A., Bar-Yosef Mayer, D.E. & Xiaohong Wu. (2017) Early Holocene palaeoseasonality inferred from the stable isotope composition of *Unio* shells from Çatalhöyük, Turkey. *Environmental Archaeology*, 22(1), 79–95.

116. Lichtenstein, J.L.L., Knutson, K., Kuo, C., Zhao, K.C., Brittingham, H.A., Geary, S.E., Ministero, S., Rice, H.K., David, Z., Scharf, I. & Pruitt, J.N. (2016) Prolonged food restriction decreases body condition and reduces repeatability in individual personalities in web-building spiders. *Behavioral Ecology & Sociobiology*, 70, 1793–1803.

117. Maor, R., Dayan, T., Ferguson-Gow, H. & Jones, K.E. (2017) Temporal niche expansion in mammals from a nocturnal ancestor after dinosaur extinction. *Nature Ecology and Evolution*, 1, 1889–1895.

118. Marusik, Y.M., Koponen, S. & Zonstein, S. (2017) A revalidation and redescription of *Sahastata infuscata*, with notes on *S. nigra* (Araneae: Filistatidae). *Arachnology*, 17(6), 309–311.

119. May, H. & Ruff, C. (2016) Physical burden and lower limb bone structure at the origin of agriculture in the Levant. *American Journal of Physical Anthropology*, 161, 26–36.

120. Meiri, S. (2017) Oceanic island biogeography: Nomothetic science of the anecdotal. *Frontiers of Biogeography*, 9, e32801. https://doi.org/10.21425/F59132081

121. Meiri, M., Barnes, I., Kosintsev, P., Meiri, S., Conroy, K. & Lister, A. (2017) Subspecies dynamics in space and time: a study of the red deer complex using ancient and modern DNA and morphology. *Journal of Biogeography*, 45(2), 367–380.

122. Meiri, S., Bauer, A.M., Allison, A., Castro-Herrera, F., Chirio, L., Colli, G.R., Das, I., Doan, T.M., Glaw, F., Grismer, L.L., Hoogmoed, M., Kraus, F., LeBreton, M., Meirte, D., Nagy, Z.T., Nogueira, C.C., Oliver, P., Pauwels, O.S.G., Pincheira-Donoso, D., Shea, G., Sindaco, R., Tallowin, O.J.S., Torres-Carvajal, O., Trape, J.-F., Uetz, P., Wagner, P., Wang, Y., Ziegler, T. & Roll, U. (2018) Extinct, obscure or imaginary: The lizard species with the smallest ranges. *Diversity and Distributions*, 24(2), 262–273.

123. Meiri, M., Stockhammer, P.W., Marom, N., Bar-Oz, G., Sapir-Hen, L., Morgenstern, P., Macheridis, S., Rosen, B., Huchon, D., Maran, J. & Finkelstein, I. (2017) Eastern Mediterranean Mobility in the Bronze and Early Iron Ages: Inferences from Ancient DNA of Pigs and Cattle. *Scientific Reports*, 7, Art. 701. https://doi.org/10.1038/s41598-017-00701-y

124. Meresman, Y. & Ribak, G. (2017) Allometry of wing twist and camber in a flower chafer during free-flight: How do wing deformations scale with body size? *Royal Society Open Science*, 4, Art. 171152. http://dx.doi.org/10.1098/rsos.171152

125. Mienis, H., Rittner. O., Hershkovitz, Y. & Eshcoly, T. (2016) A first record of the marsh hive *Euconulus praticola* from Israel (Gastropoda, Pulmonata, Euconulidae). *Triton*, 34, 21–23.

126. Mienis, H., Rittner, O., Hershkovitz, Y., Eshcoly, T. & Uekötter, L. (2016) A new exotic freshwater snail: the New Zealand mudsnail *Potamopyrgus antipodarum*, in Israel (Mollusca, Gastropoda, Tateidae). *Triton*, 34, 25–28.

127. Mienis, H.K. & Mienis, D. (2016) An additional note concerning the engraved bone disc from Ramla, Israel. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 11, 6.

128. Mienis, H.K. & Mienis, D. (2016) Exploitation of shells as building material, II. The use if *Glycymeris* valves and shell grit in the walls of houses built in 1952/3 in Kibbutz Netzer Sereni. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 12, 10.

129. Mienis, H.K. & Rittner, O. (2016) A short note concerning some freshwater Ark shells from Asia. *Ellipsaria*, 18(4), 26–27.

130. Mienis, H.K. & Rittner, O. (2016) Brief review of the freshwater Ark shells belonging to the genus *Scaphula* Benson, 1834 (Fam. Arcidae). *Triton*, 34, 16–20.

131. Mienis, H.K. & Rittner, O. (2017) A contribution to the identity of the mysterious *Helicella (Xerocrassa) seetzeni scharonica* (Mollusca, Gastropoda, Hygromiidae). *Triton*, 35, 23–24.

132. Mienis, H.K. & Rittner, O. (2017) Land snails are still being offered for sale in Yafo, Israel. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 13, 3–4.

133. Mienis, H.K. & Rittner, O. (2017) On the presence of the New Zealand Mudsnail *Potamopyrgus antipodarum* in Israel. *Ellipsaria*, 19 (3): 25–27.

134. Mienis, H.K. & Rittner, O. (2017) Some information concerning *Theodoxus (Neritaea) octagonus* Eichhorst, 2016, an endemic subterranean species from Israel. *Ellipsaria*, 19(2), 37–38.

135. Mienis, H.K. (2016) Activity pattern of the Cockchafer *Pachydema albipilis* in Kibbutz Netzer Sereni, Israel, in 2016. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 11, 7–9.

136. Mienis, H.K. (2016) Additional notes on amphibious and aquatic molluscs from a drainage ditch in the dunes near Oosterend, Terschelling, the Netherlands. *Ellipsaria*, 18(4), 23–25.

137. Mienis, H.K. (2016) De graficus Escher in het voetspoor van Rembrandt: twee houtsnedes van "linksgewonden" zeeslakken de Letterkegelslak *Conus litteratus* en David's harpslak *Harpa davidis*. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 12, 11–12.

138. Mienis, H.K. (2016) De Zandslak: een nieuwe soort voor Purmerend. *De Snip*, 37(4), 18–19 (printed) & 21–22 (digital).

139. Mienis, H.K. (2016) Iets over de spieringvisserij in de grachten van Amsterdam. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 12: 3–6.

140. Mienis, H.K. (2016) Malacological publications of Abraham Singer and eponyms in his honor. *Triton*, 34, 1–2.

141. Mienis, H.K. (2016) Naaktslakken geïnfecteerd met slakkenmijten op de begraafplaats aan de Overweersepolderdijk in Purmerend, Nootd-Holland. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 11, 10–12.

142. Mienis, H.K. (2016) Nieuwe vindplaatsen van de Donkere landplatworm *Microplana terrestris* in Nederland. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 11, 3–5.

143. Mienis, H.K. (2016) Some additional information concerning the possible presence of *Rumina saharica* in Menton. *Triton*, 34, 24.

144. Mienis, H.K. (2016) Terrestrial flatworms in Israel, 4: Finds of *Microplana* cf. *terrestris* (Tricladida, Continenticola, Geoplanoidea, Geoplanidae). *Natuurhistorische en Andere Notities – Natural History and other Notes*, 12, 7–9.

145. Mienis, H.K. (2017) A final report concerning the mollusks from the PPNB-site of Motza, Judean Hills, Israel. *Triton*, 35, 29–36.

146. Mienis, H.K. (2017) A first record of the Harlequin ladybird *Harmonia axyridis* from Israel (Coleoptera, Coccinellidae). *Natuurhistorische en Andere Notities – Natural History and other Notes*, 14, 5–7.

147. Mienis, H.K. (2017) A note on Coccinellidae found on the Chinese rose *Hibiscus rosa-sinensis* in a garden in Kibbutz Netzer Sereni, Israel. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 13, 9–10.

148. Mienis, H.K. (2017) A rare Philistine coin from the cotton fields of Kibbutz Netzer Sereni, Israel. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 15, 11–12.

149. Mienis, H.K. (2017) Activity pattern of the Cockchafer *Aplidia chaifensis* in Kibbutz Netzer Sereni, Israel, in 2017. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 14, 3–4.

150. Mienis, H.K. (2017) Additional information concerning the conquest of Europe by the invasive Chinese Pond mussel *Sinanodonta woodiana*, 44. News from Austria, Belgium and France, but what about Israel? *Ellipsaria*, 19(2), 36–37.

151. Mienis, H.K. (2017) Additional information concerning the conquest of Europe by the invasive Chinese Pond mussel *Sinanodonta woodiana*, 45. News from Austria, the Czech Republic, Poland and Spain. *Ellipsaria*, 19(3), 27–28.

152. Mienis, H.K. (2017) Colonies of breeding Monk parakeets *Myiopsitta monachus* in Kibbutz Netzer Sereni, Israel. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 14, 10–13.

153. Mienis, H.K. (2017) Een dôbe vol Moeras-hoornschalen. *Rinkelbollen*, 2017(1), 18–20.

154. Mienis, H.K. (2017) Een eerste vondst van de Donkere landplatworm op Terschelling. *Rinkelbollen*, 2017(2), 8–9.

155. Mienis, H.K. (2017) Een IJsvogel bij de uitwateringssluis van Lies op Terschelling. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 13, 11–12.

156. Mienis, H.K. (2017) Een laatste blik op de landslakken van de begraafplaats aan de Overweersepolderdijk in Purmerend. *De Snip*, 38(2), 39–41. (digital edition)

157. Mienis, H.K. (2017) Een verrassende vondst van de Posthorenslak in de Bulldozerplas. *Rinkelbollen*, 2017(3), 4–6.

158. Mienis, H.K. (2017) Enkele dieren en planten nabij de rotonde op het kruispunt Neckerstraat-Verbindingsweg in Purmerend, 1. De Zandslak *Theba pisana*. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 13, 7–8.

159. Mienis, H.K. (2017) Enkele dieren en planten nabij de rotonde op het kruispunt Neckerstraat-Verbindingsweg in Purmerend, 2. De Zuringrandwants *Coreus marginatus*. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 14: 8–9.

160. Mienis, H.K. (2017) Enkele dieren en planten nabij de rotonde op het kruispunt Neckerstraat-Verbindingsweg in Purmerend, 3. Wilde cichorei *Cichorium intybus*. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 14, 14.

161. Mienis, H.K. (2017) *Palisadia rittneri*, a new species from the Gulf of Aqaba (Mollusca, Gastropoda, Eulimidae). *Triton*, 35: 13–14.

162. Mienis, H.K. (2017) *Psyllobora vigintiduopunctata*: een Lieveheersbeestje dat zich iets anders gedraagt. *Rinkelbollen*, 2017(2), 18–19.

163. Mienis, H.K. (2017) Surprises on the beach after stormy weather, 1: A find of a living Fowler's Shortface eel on the beach of Ziqim. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 15, 6.

164. Mienis, H.K. (2017) Terrestrial flatworms in Israel, 5: Finds of *Parakontikia ventrolineata* (Tricladida, Continenticola, Geoplanoidea, Geoplanidae). *Natuurhistorische en Andere Notities – Natural History and other Notes*, 13, 5–6.

165. Mienis, H.K. (2017) Vondsten van oude tabakspijpen in Nederland en Israël, 1: Een pijp met een schelpmotief van Schellingwoude. *Natuurhistorische en Andere Notities – Natural History and other Notes*, 15, 3–5.

166. Mienis, H.K. (2017) Waarnemingen van de Grote zilverreiger in Groot-Waterland. *De Snip*, 38(1), 22–23.

167. Mienis, H.K. (2017) When will the electricity pole come down? *Natuurhistorische en Andere Notities – Natural History and other Notes*, 15, 7–10.

168. Mienis, H.K. (2017) *Xerocrassa zviae*, a new species of land snail from the Judean Desert, Israel (Mollusca, Gastropoda, Hygromiidae). *Triton*, 35, 25–28.

169. Mienis, H.K., Ilan, M., Shefer, S., Idan, T., Weinberger, A., Ashkenazi, A. & Levy, M. (2016) A first observation of the nudibranch *Felimare orsinii* in the Mediterranean off Israel (Mollusca, Gastropoda, Chromodorididae). *Triton*, 34, 11–12.

170. Mienis, H.K., Rittner, O. & Vaisman, S. (2016) Information concerning *Eobania vermiculata*, I. On the presence of this exotic species in Israel (Mollusca, Gastropoda, Helicidae). *Triton*, 34, 29–36.

171. Mienis, H.K., Rittner, O. & Vaisman, S. (2017) Information concerning *Eobania vermiculata*, II. On the presence of extra-territorial material in the National Mollusc Collections in Israel (Mollusca, Gastropoda, Helicidae). *Triton*, 35, 15–22.

172. Mienis, H.K., Rittner, O., Hershkovitz, Y. & Eshcoly, T. (2016) A first record of the Marsh hive *Euconulus praticola* from Israel (Gastropoda, Pulmonata, Euconulidae). *Triton*, 34, 21–23.

173. Moitinho-Silva, L., Nielsen Sh., Amir, A., … Ilan, M. *et al*. (2017) The sponge microbiome project. *Gigascience*, 6(10), 1–7. https://dx.doi.org/10.1093%2Fgigascience%2Fgix077

174. Morgulis, E., Freidberg, A. & Dorchin, N. (2016) Phylogenetic revision of *Tephritomyia* Hendel (Diptera: Tephritidae), with description of 14 new species. *Annals of the Entomological Society of America*, 109(4), 595–628.

175. Müller, G.C., Junnila, A., Traore, M.M., Revay, E.E., Traore, S.F., Doumbia, S., Schlein, Y., Kravchenko, V.D., Rui-De Xue, Tsabari, O. & Beier, J.C. (2017) A novel window entry/exit trap for the study of endophilic behavior of mosquitoes. *Acta Tropica*, 167, 137–141.

176. Müller, G.C., Junnila, A, Traore, M.M., Traore, S.F., Doumbia, S., Sissoko, F., Dembele, S.M., Schlein, Y., Arheart, K.L., Revay, E.E., Kravchenko, V.D., Witt, A.B.R. & Beier, J. (2017) The invasive shrub *Prosopis juliflora* enhances the malaria parasite transmission capacity of *Anopheles* mosquitoes: a habitat manipulation experiment. *Malaria Journal*, 16: Art. 237. https://doi.org/10.1186/s12936-017-1878-9

177. Novosolov, M., Rodda, G.H., Gainsbury, A.M. & Meiri, S. (2018) Dietary niche variation and its relationship to lizard population density. *Journal of Animal Ecology*, 87(1), 285–292.

178. Novosolov, M., Rodda, G.H., North, A.C., Butchart, S.H.M., Tallowin, O.J.S., Gainsbury, A.M. & Meiri, S. (2017) Population density–range size relationship revisited. *Global Ecology and Biogeography*, 26, 1088–1097.

179. Ofir, E., Heymans, J.J., Shapiro, J., Goren, M., Spanier, E. & Gal, G. (2017) Predicting the impact of Lake Biomanipulation based on food-web modeling – Lake Kinneret as a case study. *Ecological Modelling*, 348(C), 14–24.

180. Om, N., Yefremova, Z.A., Yegorenkova, E.N., Beattie, G.A.C., Donovan, N.J. & Holford, P. (2017) A new species of *Tamarixia* Mercet (Hymenoptera, Eulophidae), a parasitoid of *Diaphorina communis* Mathur (Hemiptera, Liviidae) in Bhutan. *Asian Pacific Entomology*, 20(2), 728–738.

181. Ovechkina, M.N., Jordan, R.W. & Mostovski, M.B. (2017) On the validity, synonymy and distribution of some Lapideacassaceae (Haptophyta). *Phytotaxa*, 308(1), 111–117.

182. Paz, Y., Ackermann, O., Avni, Y., Ben-Hur, M., Birkenfeld, M., Langgut, D., Mizrahi, S., Weiss, E. & Porat, N. (2017) The Earliest Compost Pit? An Early Bronze Age Fertilized Agricultural Plot Discovered near Tel Yarmouth, Ramat Bet Shemesh, Israel. *Journal of Archaeological Science: Reports*, 15, 226–234.

183. Perl, R.G.B., Gafny, S., Malka, Y., Renan, S., Woodhams, D., Rollins-Smith, L., Pask, J.D., Bletz, M., Geffen, E. & Vences, M. (2017) Natural history and conservation of the rediscovered Hula painted frog, *Latonia nigriventer*. *Contributions to Zoology*, 86, 11–36.

184. Pisanty, G., Scheuchl, E. & Dorchin, N. (2016) Eight new species of *Andrena* (Hymenoptera: Apoidea: Andrenidae) from Israel – a Mediterranean hotspot for wild bees. *Zootaxa*, 4189(3), 485–515.

185. Pisanty, G., Scheuchl, E. & Dorchin, N. (2018) Taxonomic review of the subgenus *Andrena (Poecilandrena)* (Hymenoptera: Andrenidae) in Israel and the Levant. *Zootaxa*, 4374(2), 151–188.

186. Prat, Y., Azoulay, L., Dor, R. & Yovel, Y. (2017) Crowd vocal learning induce vocal dialects in bats: playback of conspecifics shapes fundamental frequency usage by pups. *PloS Biology*, 15(10), Art. e2002556. https://doi.org/10.1371/journal.pbio.2002556

187. Ranc, N., Santini, L., Rondinini, C., Boitani, L., Poitevin, F., Angerbjörn, A. & Maiorano, L. (2017) Performance tradeoffs in target-group bias correction for species distribution models. *Ecography*, 40(9), 1076–1087.

188. Rapuano, H., Brickner, I., Shlesinger, T., Meroz-Fine, E., Tamir, R. & Loya, Y. (2017) Reproductive strategies of the coral *Turbinaria reniformis* in the northern Gulf of Aqaba (Red Sea). *Scientific Reports*, 7, 42670. https://doi.org/10.1038/srep42670

189. Renan, S., Gafny, S., Perl, R.G.B., Roll, U., Malka, Y., Vences, M. & Geffen, E. (2017). Living quarters of a living fossil – Uncovering the current distribution pattern of the rediscovered Hula painted frog (*Latonia nigriventer*) using environmental DNA. *Molecular Ecology*, 26(24), 6801–6812.

190. Ribak, G., Barkan, S. & Soroker, V. (2017) The aerodynamics of flight in an insect flightmill. *PLoS One*, 12, e0186441. https://doi.org/10.1371/journal.pone.0186441

191. Roll, U., Feldman, A., Novosolov, M., Allison, A., Bauer, A., Bernard, R., Bohm, M., Chirio, L., Collen, B., Colli, G.R., Dabul, L., Das, I., Doan, T., Grismer, L., Herrera, F.C., Hoogmoed, M., Itescu, Y., Kraus, F., LeBreton, M., Lewin, A., Martins, M., Maza, E., Meirte, D., Nagy, Z., Nogueira, C.C., Pauwels, O.S.G., Pincheira-Donoso, D., Powney, G., Sindaco, R., Tallowin, O., Torres-Carvajal, O., Trape, J.F., Uetz, P., Vidan, E., Wagner, P., Wang, Y.Z., Orme, D., Grenyer, R. & Meiri, S. (2017) The global distribution of tetrapods reveals a need for targeted reptile conservation. *Nature Ecology and Evolution*, 1, 1677–1682.

192. Rothman, S.B-S., Mienis, H.K. & Galil, B.S. (2017) Alien facelinid nudibranchs in the Eastern Mediterranean: first report of *Phidiana militaris* (Alder and Hancock, 1864) and report of *Caloria indica* (Bergh, 1896) 30 years after its previous sighting. BioInvasions Records, 6(2), 125–128. https://doi.org/10.3391/bir.2017.6.2.06

193. Rubino, F., Belmonte, M. & Galil, B.S. (2017) Plankton resting stages in recent sediments of Haifa port, Israel (Eastern Mediterranean) – distribution, viability and potential environmental consequences. *Marine Pollution Bulletin*, 116(1–2), 258–269.

194. Saar, M., Gilad, T., Killon-Kallner, T., Rosenfeld, A., Subach, A. & Scharf, I. (2017) The interplay between maze complexity, colony size, learning and memory in ants while solving a maze: A test at the colony level. *PLoS One*, 12, Art. e0183753. https://doi.org/10.1371/journal.pone.0183753

195. Santini, L., Belmaker, B., Costello, M.J., Pereirae, H.M., Rossberg, A.G., Schipper, A.M., Ceauşu, S., Dornelas, M., Hilbers, J., Hortal, J., Huijbregts, M.A.J., Navarro, L.M., Schiffer, K.H., Visconti, P. & Rondinini, C. (2016) Assessing the suitability of diversity metrics to detect biodiversity change. *Biological conservation*, 213(B), 341–350.

196. Sapir-Hen, L., Sharon, I., Gilboa, A. & Dayan, T. (2017) Wet sieving a complex *Tell*: Implications for retrieval protocols and studies of animal economy in historical periods. *Journal of Archeological Science*, 82, 72–79.

197. Sapir-Hen, L., Martin, M.A.S. & Finkelstein, I. (2017) Food rituals and their social significance in the mid-second millennium BC: A view from Megiddo. *International Journal of Osteoarchaeology*, 27(6), 1048–1058.

198. Sarig, R. & Tillier, A.M. (2016) Dental wear patterns in early modern humans from Skhul and Qafzeh: A response to Luca Fiorenza and Ottmar Kullmer. *HOMO-Journal of Comparative Human Biology*, 67(1), 85–87.

199. Sarig, R., Gopher, A., Barkai, R., Rosell, J., Blasco, R., Weber, G.W., Fornai, C., Sella-Tunis, T. & Hershkovitz, I. (2016) How did the Qesem Cave people use their teeth? Analysis of dental wear patterns. *Quaternary International*, 398, 136–147.

200. Scharf, I., Daniel, A., MacMillan, H.A. & Katz, N. (2017) The effect of fasting and body reserves on cold tolerance in two pitbuilding insect predators. *Current Zoology*, 63, 287–294.

201. Scharf, I., Wexler, Y., MacMillan, H.A., Presman, S., Simson, E. & Rosenstein, S. (2016) The negative effect of starvation and the positive effect of mild thermal stress on thermal tolerance of the red flour beetle. *Science of Nature*, 103, Art. 20. https://doi.org/10.1007/s00114-016-1344-5

202. Schipper, A.M., Belmaker, J., Dantas de Miranda, M., Navarro, L.M., Böhning-Gaese, K., Costello, M.J., Dornelas, M., Foppen, R., Hortal, J., Huijbregts, M.A.J., Martín-López, B., Pettorelli, N., Queiroz, C., Rossberg, A.G., Santini, L., Schiffers, K., Steinmann, Z.J.N., Visconti, P., Rondinini, C. & Pereira, H.M. (2016) Contrasting changes in the abundance and diversity of North American bird assemblages from 1971 to 2010. *Global Change Biology*, 22, 3948–3959.

203. Schwarz, R. & Meiri, S. (2017) The fast-slow life-history continuum in insular lizards: A comparison between species with invariant and variable clutch sizes. *Journal of Biogeography*, 44, 2808–2815.

204. Sella Tunis, T., Sarig, R., Cohen, H., Medlej, B., Peled, N. & May, H. (2017) Sex estimation using computed tomography of the mandible. *International Journal of Legal Medicine*, 131, 1691–1700.

205. Shachar, E., Inbar, M. & Dorchin, N. (2017) Taxonomy and biology of *Andricus morula*, a new gall-wasp species (Hymenoptera: Cynipidae: Cynipini) from Mt Hermon, Israel. *Israel Journal of Entomology*, 47, 87–96.

206. Shamoon, H., Saltz, D. & Dayan, T. (2017) Fine scale temporal and spatial population fluctuations of medium sized carnivores in a Mediterranean agricultural matrix. *Landscape Ecology*, 32(6), 1243–1256.

207. Shamoon, H., Dayan, T. & Saltz, D. (2017) Indirect cattle grazing effects on endangered mountain gazelles (*Gazella gazella*) in Mediterranean natural landscapes. *Journal of Wildlife Management*, 81(8), 1351–1362.

208. Shenkar, N., Shmuel, Y. & Huchon, D. (2017) The invasive ascidian *Ciona robusta* recorded from a Red Sea marina. *Marine Biodiversity*. https://doi.org/10.1007/s12526-017-0699-y

209. Shlesinger, T., Bronstein, O. & Loya, Y. (2016) Spawning behavior of the sand dollar *Sculpsitechinus auritus* (Leske, 1778). *Coral Reefs*, 35(1), 327–327.

210. Shlesinger, T., Grinblat, M., Rapuano, H., Amit, T. & Loya, Y. (2018). Can mesophotic reefs replenish shallow reefs? Reduced coral reproductive performance casts a doubt. *Ecology*, 99(2), 421–437.

211. Shlesinger, T. & Loya, Y. (2016) Recruitment, mortality and resilience otential of scleractinian corals at Eilat, Red Sea. *Coral Reefs*, 35(4), 1357–1368.

212. Shlesinger, T., Shenkar, N. & Loya, Y. (2017) Gamete spawning of the ascidian *Phallusia nigra* in the Red Sea. *Bulletin of Marine Science*, 93(4), 959–960.

213. Sinaiko, G., Magory-Cohen, T., Meiri, S. & Dor, R. (2018) Taxonomic revision of Israeli snakes belonging to the *Platyceps rhodorachis* species complex (Reptilia: Squamata: Colubridae). *Zootaxa*, 4379(3), 301–346.

214. Slon, V., Glocke, I., Barkai, R., Gopher, A., Hershkovitz, I. & Meyer, M. (2016) Mammalian mitochondrial capture, a tool for rapid screening of DNA preservation in faunal and undiagnostic remains, and its application to Middle Pleistocene specimens from Qesem Cave (Israel). *Quaternary International*, 398, 210–218.

215. Stephens, N.B., Kivell, T.L., Gross, T. Pahr, D.H., Lazenby, R.A., Hublin, J.J., Hershkovitz, I. & Skinner, M.M. (2016) Trabecular architecture in the thumb of *Pan* and *Homo*: implications for investigating hand use, loading, and hand preference in the fossil record. *American Journal of Physical Anthropology*, 161, 603–619.

216. Stern, N., Douek, J., Goren, M. & Rinkevich, B. (2017) With no gap to mind: A shallow genealogy within the world's most widespread small pelagic fish. *Ecography*, 40, 1–13.

217. Tallowin, O.J.S., Allison, A., Algar, A.C., Kraus, F. & Meiri, S. (2017) Papua New Guinea terrestrial-vertebrate richness: elevation matters most for all except reptiles. *Journal of Biogeography*, 44, 1734–1744.

218. Vaisman, S. & Mienis, H.K. (2017) Molluscs intercepted at the borders of Israel in 2016. *Tentacle*, 25, 15–16.

219. van Rijn, I., Buba, H., DeLong, J.P., Kiflawi, M. & Belmaker, J. (2017) Large but uneven reduction in fish size across species in relation to warming temperatures. *Global Change Biology*, 23, 3667–3674.

220. Vidan, E., Roll, U., Bauer, A.M., Grismer, L.L., Guo, P., Maza, E., Novosolov, M., Sindaco, R., Wagner, P., Belmaker, J. & Meiri, S. (2017) The Eurasian hot nightlife – environmental forces associated with nocturnality in lizards. *Global Ecology and Biogeography*, 26(11), 1316–1325.

221. Villalobos, S.M., Lambert, G., Shenkar, N. & López-Legentil, S. (2017) Distribution and population dynamics of key ascidians in North Carolina harbors and marinas. *Aquatic Invasions*, 12(4), 447–458.

222. Weber, G.W., Fornai, C., Gopher, A., Barkai, R., Sarig, R. & Hershkovitz, I. (2016) The Qesem cave hominin material (Part 1): a morphometric analysis of the mandibular premolars and molar. *Quaternary International*, 398, 159–174.

223. Wexler, Y. & Scharf, I. (2017). Distinct effects of two separately applied stressors on behavior in the red flour beetle. *Behavioural Processes*, 145, 86–92.

224. Wexler, Y., Subach, A., Pruitt, J.N. & Scharf, I. (2016) Behavioral repeatability of flour beetles before and after metamorphosis and throughout aging. *Behavioral Ecology & Sociobiology*, 70, 745–753.

225. Wexler, Y., Wertheimer, K.O., Subach, A., Pruitt, J.N. & Scharf, I. (2017). Mating alters the link between movement activity and pattern in the red flour beetle. *Physiological Entomology*, 42(4), 299–306.

226. Winter, S., Friedman, A.L.L., Astrin, J.J., Gottsberger, B. & Letsch, H. (2017) Timing and host plant associations in the evolution of the weevil tribe Apionini (Apioninae, Brentidae, Curculionoidea, Coleoptera) indicate an ancient co-diversification pattern of beetles and flowering plants. *Molecular Phylogenetics and Evolution*, 107, 179–190.

227. Yahalomi, D., Haddas-Sasson, M., Rubinstein, N., Feldtein, T., Diamant, A. & Huchon, D. (2017) The multipartite mitochondrial genome of *Enteromyxum leei* (Myxozoa): seven fast evolving megacircles. *Molecular Biology and Evolution*, 34, 1551–1556.

228. Yanai, Z., Sartori, M., Dor, R. & Dorchin, N. (2017) Molecular phylogeny and morphological analysis resolve long-standing controversy over generic concepts in the Heptageniidae (Ephemeroptera). *Systematic Entomology*, 42(1), 182–193.

229. Yanai, Z., Dayan, T., Mienis, H. & Gasith, A. (2017) Pet shops and plant nurseries as vectors for introduction and dispersal of non-indigenous freshwater mollusks. *Management of Biological Invasions*, 8(4), 523–532.

230. Hershkovitz, Y. & Gal, G. (2017) Biological monitoring as a tool for ecological assessment of streams in the Lake Kinneret watershed: the biology as a public-service provider. *Eretz Hakinneret Magazine*, 18, 28–29. [in Hebrew]

231. Yavno, S. & Holzman, R. (2018) Do viscous forces affect survival of marine fish larvae? Revisiting the 'safe harbour' hypothesis. *Reviews in Fish Biology and Fisheries*, 28(1), 201–212.

232. Yefremova, Z. (2017) New records of the genus *Euplectrus* Westwood (Hymenoptera: Eulophidae) from Southeast Asia, South Asia and Oceania, with description of three new species and a key. *Israel Journal of Entomology*, 47, 55–85.

233. Yefremova, Z., Kravchenko, V. & Meltzer, N. (2017) The East-Mediterranean cereal leaf miner *Syringopais temperatella* Lederer and its larval parasitoids in Israel. *Phytoparasitica*, 45(5), 707–713.

234. Yefremova, Z.A., Yegorenkova, E., Stojanova, A. & Boyadzhiev, P. (2017) A new species of the genus *Omphale* Haliday, 1833 (Hymenoptera, Eulophidae, Entedoninae) from Bulgaria. *Acta zoologica Bulgarica*, Suppl. 8, 119–122.

235. Zarnetske, P., Baiser, B., Strecker, A., Record, S., Belmaker, J. & Tuanmu, M.N. (2017) The interplay between landscape structure and biotic interactions. *Current Landscape Ecology Reports*, 2(1), 12–29.

236. Zonstein, S.L. (2017) Notes on *Nemesia* and *Iberesia* in the J. Murphy spider collection of the Manchester Museum (Araneae: Nemesiidae). *Israel Journal of Entomology*, 47, 141–158.

237. Zonstein, S.L. & Marusik, Y.M. (2017) Descriptions of the two-eyed African spider genera *Chedimanops* gen. n. and *Hybosidella* gen. n. (Araneae, Palpimanidae, Chediminae). *African Invertebrates*, 58(1), 23–47.

238. Zonstein, S.L. & Marusik, Y.M. (2017) A redescription of *Chedima purpurea* Simon, 1873, with notes on the unique copulative stopper mechanism in females (Aranei: Palpimanidae). *Arthropoda Selecta*, 26(3), 225–232.

239. Zonstein, S.L., Marusik, Y.M. & Kovblyuk, M.M. (2017) New data on the spider genus *Levymanus* (Araneae: Palpimanidae). *Oriental Insects*, 51(3), 221–226.

240. Zvuloni, A. & Belmaker, J. (2016) Estimating ecological count-based measures from the point-intercept method. *Marine Ecology Progress Series*, 556, 123–130.

241. Accepted for publication

242. Blowes, A. & Belmaker, J., Chase J. (in press) Scale-dependent dissections of global reef fish diversity gradients. *Proceedings of the Royal Society B.*

243. Comay, O. & Dayan, T. (in press) What determines prey selection in owls? Roles of prey traits, prey class, environmental variables, and taxonomic specialization. *Ecology and Evolution*. http://doi.org/10.1002/ece3.3899

244. Davidovich, U., Ullman, M., Langford, B., Frumkin, A., Langgut, D., Yahalom-Mack, N., Abramov, J. & Marom, N. (in Press). Distancing the Dead: Late Chalcolithic burials in large maze caves in the Negev Desert, Israel. *Bulletin of the American Schools of Oriental Research (BASOR)*.

245. Dornelas, M., Malamud, S., Blowes, S.A., van Rijn, I., Givan, O. & Belmaker, J. (in press) BioTIME: a database of biodiversity time series for the Anthropocene. *Global Ecology and Biogeography*.

246. Eppelbaum, L., Katz, Y., Klokočník, J., Kostelecký, J., Zheludev, V. & Ben-Avraham, Z. (in press) Tectonic insights into the Arabian-African region inferred from a comprehensive examination of satellite gravity big data. *Global and Planetary Change*. https://doi.org/10.1016/j.gloplacha.2017.10.011

247. Finkelstein, I. & Langgut, D. (in press) Climate, Settlement Patterns and Olive Cultivation in the Iron Age Southern Levant. *Bulletin of the American Schools of Oriental Research (BASOR)*.

248. Gordon, T. & Shenkar, N. (in press) Regeneration abilities of four solitary ascidians of the order Stolidobranchia. *Scientific Reports*.

249. Idan, T., Shefer, S., Feldstein, T., Yahel, R., Huchon, D. & Ilan, M. (in press) Shedding light on an East-Mediterranean mesophotic sponge ground community and the regional sponge fauna. *Mediterranean Marine Science*. http://dx.doi.org/10.12681/mms.13853

250. Mendelsohn, O., Dayan, T., Aidlin-Harari, S., Silberstein, M., Orlov, V. & Blank, L. (in press) Mediterranean fruit fly sub-plot hotspot detection for monitoring optimization. *Journal of Applied Entomology*.

251. Muller, B. & Mostovski, M.B. (in press) A key to males of *Atherigona* s. str. (Diptera: Muscidae) from Mali, with new records and a new species for the country. *Zootaxa*.

252. Pines, M., Sapir-Hen, L. & Tal, O. (in press) Consumption and disposal practices in the southern Levant in Late Antiquity: animal bones from Apollonia/Sozousa's hinterland as a case study. *Zeitschrift des Deutschen Palästina-Vereins.*

253. Quicke, D.L.J., Kuslitzky, W. & Butcher, B.A. (in press) First host record for Old World *Yelicones* (Hymenoptera: Braconidae: Rogadinae) adds to evidence that they are strictly parasitoids of Pyralidae (Lepidoptera). *Israel Journal of Entomology*.

254. Saar, M., Subach, A., Reato, I., Liber, T., Pruitt, J.N. & Scharf, I. (in press) Consistent differences in foraging behavior in 2 sympatric harvester ant species may facilitate coexistence. *Current Zoology*. https://doi.org/10.1093/cz/zox054

255. Scharf, I., Wertheimer, K.O., Xin, J.L., Gilad, T., Goldenberg, I. & Subach, A. (in press) Context-dependent effects of cold stress on behavioral, physiological, and life-history traits of the red flour beetle. *Insect Science*. https://doi.org/10.1111/1744-7917.12497

256. Wexler, Y., Wertheimer, K.O., Subach, A., Pruitt, J.N. & Scharf, I. (2017). Mating alters the link between movement activity and pattern in the red flour beetle. *Physiological Entomology*, 42(4), 299–306.

Chapters in books

1. Bar-Yosef Mayer, D.E. (2017) The exploitation of aquatic resources during the Quaternary. *In*: Enzel, Y. & Bar-Yosef, O (Eds), *Quaternary of the Levant: Environments, Climate Change, and Humans*. Cambridge University Press, Cambridge, UK. Pp. 377–380.

2. Dayan, T. & Galil, B.S. (2017) Natural history collections as dynamic research archives. *In*: Shavit, A. & Ellison, M. (Eds), *Stepping in the Same River Twice: Replication in Biological Research*. Yale University Press. Pp. 55–63.
3. Dorchin, N., Harris, K.M. & Jaschhof, M. (2017). Cecidomyiidae (Chapter 22). *In*: Kirk-Spriggs, A. & Sinclair, B. (Eds), *Manual of Afrotropical Diptera*. South African National Biodiversity Institute, Pretoria. Pp. 107–125.
4. Galil, B.S. (2017) Eyes wide shut: Managing bio-invasions in the Mediterranean marine protected areas. *In*: Goriup, P.D. (Ed.), *Management of Marine Protected Areas: A Network Perspective*. John Wiley and Son. Pp. 187–206.
5. Langgut, D. (2017) Palynological analysis of the Glacis of the Seleucid Acra in Jerusalem: Duration of construction and environmental reconstruction. *In*: Lipschits, O., Gadot, Y. & Adams, M.J. (Eds), *Rethinking Israel: Studies in the History and Archaeology of Ancient Israel* in Honor of Israel Finkelstein. Eisenbrauns, Winona Lake, IN, USA. Pp. 207–220.
6. Mienis, H.K. (2016) *Aspatharia rubens* shells. *In*: Yannai, E. (Ed.), *'En Esur ('Ein Asawir) II excavations at the cemeteries, 87*. Israel Antiquities Authority, Ostracon.

Accepted for publication

1. Benzaquen, M. & Langgut, D. (in press) The charcoal remains. *In*: Finkelstein, I., Martin, M.A.S. and Adams, M.J. (Eds), *Megiddo VI: The 2010–1014 Seasons*. (Monograph Series of the Institute of Archaeology of Tel Aviv University). Tel Aviv.
2. Langgut, D., Namdar, D., Shahack-Gross, R., Arie, E. & Finkelstein, I. (in press) A Latrine in Level H-14. *In*: Finkelstein, I. & Martin, M.A.S. (Eds), *Megiddo VI: The 2010-1014 Seasons*. (Monograph Series of the Institute of Archaeology of Tel Aviv University). Tel Aviv.
3. Yom-Tov, Y. & Geffen, E. (in press) Intra-specific nest parasitism among birds: The effects of phylogeny, mode of reproduction and geographic distribution. *In*: Soler, M. (Ed.), Avian Brood Parasitism – Behaviour, Ecology, Evolution and Coevolution. Springer-Verlag.

Papers presented in scientific meetings

2016 Mobility between the Aegean and the Levant in the Late Second Millennium BCE: inference from ancient DNA of pigs. International Symposium on Biomolecular Archaeology. Oxford, UK (Meieri, M.).

2016 One invasive fish and two new parasites. 3rd Conference of Young Natural History Scientists Meeting. 2-5 February Paris, France (Rothman S., Goran M., Diamant A.).

2017 Biomechanics and mate selection in the copulatory flight of the blue-tailed damselfly (Ischnura elegans). SEB 2017, Gothenburg, Sweden. (Davidovich, H. and Ribak, G.)

2017 Context-dependent effects of chronic stress on physiological, behavioral, and life-history. Biannual Meeting of the European Society of Evolutionary Biology, Groningen, Netherlands (Scharf I.).

2017 Don't forget to forget: ants learn to solve a maze on their way to a food reward. International Ethological Conference, Estoril, Portugal (Saar I, Subach A, Scharf I.).

2017 Environmental factors affecting alpha and beta diversity of mayfly communities in a hierarchical lotic system. 10th Symposium for European Freshwater Sciences. Olomouc, Czech Republic (Yanai Z. and Dorchin N.).

2017 Free-living nematodes as the best biological tools for assessing soil disturbances. 12th International Symposium of the Russian Sosiety of Nematologists, "Nematodes and other Ecdysozoa under the growing ecological footprint on ecosystems". July 31-August 6, 2017 (Pen-Mouratov S., Steinberger Y., Meller R., Shukurov N., Liu R.)

2017 Fusulinides from Bashkirian/ Moscovian transition in the Carboniferous of Eurasia: phylogeny, distribution, stratigraphical potential. Kazan Golovkinsky Stratigraphic Meeting – 2017 Upper Palaeozoic Earth systems: high-precision biostratigraphy, geochronology and petroleum resources. Abstract volume. Kazan, September, 19–23, 2017, Kazan University Press. P.78-79 (Tatiana N. Isakova, Aleksandra V. Dzhenchuraeva, Olga B. Orlov-Labkovsky).

2017 Impact of invasive tree species Eucalyptus Camaldulensis on soil biota abundance and diversity in Israel. 12th International Symposium of the Russian Sosiety of Nematologists, "Nematodes and other Ecdysozoa under the growing ecological footprint on ecosystems". July 31-August 6, 2017 (Pen-Mouratov S., Avisar A., Dayan T).

2017 Introduced and native ascidian microbiomes from artificial versus natural habitats. 9th International Tunicata meeting, July NY, USA 2017 (López-Legentil S, Evans JS, Shenkar N, Erwin PM)

2017 Med *vs.* Red: temperature sensitivity of the non-indigenous ascidian *Herdmania momus* in the Mediterranean Sea. 9th International Tunicata meeting, July NY, USA (Gewing M, Shenkar N)

2017 Progress on the taxonomy and systematics of three Indo-Pacific fish genera. 10th Indo-Pacific Fish Conference. Papeete, Tahiti French Polynesia. 2-6 October (O. Gon, M. Okamoto, R. Leslie, G. Gouws, D. Golani, M. Goren, N. Stern).

2017 Spatial variation in foraminifera distribution and occurrence in response to changes in the sedimentary environments and global changes; the tropical Middle – Late Permian to Early Triassic marginal marine strip of Gondwana supercontinent. The 5th IGCP 630 Field Workshop Permian and Triassic Integrated Stratigraphy and Climatic, Environmental and Biotic Extremes. October 8 to 14, 2017, Yerevan, Armenia. P.26 (Orlov-Labkovsky, O., Korngreen, D.)

2017 Strategy and mechanisms for intercepting unpredictable targets in the blue-tailed damselfly – Ischnura elegans. ESA 2017, Denver, CO, USA (Kassner, Z. and Ribak, G.).

2017 The estuarine environments: new insights from combining isotopic, sedimentary and biostratigraphy constrains on the tropical Middle – Late Permian to Early Triassic marginal marine strip of Gondwana supercontinent. The 5th IGCP 630 Field Workshop Permian and Triassic Integrated Stratigraphy and Climatic, Environmental and Biotic Extremes. October 8 to 14, 2017, Yerevan, Armenia. P. 25 (Korngreen, D., Orlov-Labkovsky, O., Zilberman, T.)

2017 The History of *Citrus medica* (citron) in the Near East: Botanical remains and ancient art and texts. In: V. Zech, G. Fiorentino, and S. Coubray (eds.). The history and archaeology of the citrus fruit from the Far East to the Mediterranean: introductions, diversifications, uses. Centre Jean Bérard, Naples (Langgut D).

2017 Upper Palaeolithic explorers: The geographic sources of shell beads in Upper Palaeolithic assemblages in Israel.Humans' Earliest Personal Ornaments: Symbolism, Production and Distribution. The Steinhardt Museum of Natural History, Tel Aviv University. (Bar-Yosef Mayer D.E.).

2017 When 1 become 2 – the potential of Polycarpa mytiligera as a new model species in regenerative studies. 9th International Tunicate meeting, July NY, USA (Gordon T, N Shenkar).

GRADUATE STUDENTS

Much active scientific research is conducted by graduate students. Here we list the graduate students of faculty members affiliated to the Steinhardt Museum of Natural History at the Tel Aviv University. We list also a few graduate students from other higher education institutions, but names and affiliations of many others from Israel and abroad who used the collections are unknown to us.

PhD students

2005– Tal Levanony (T. Dayan)
Patterns of biodiversity in natural and cultural landscapes: a model Mediterranean forest ecosystem.

2008– Ariella Gotlieb (T. Dayan and Y. Mandelik)
Agriculture and conservation in the Arava Valley

2009– Ittai Renan (A. Freidberg)
Taxonomy and ecology of dune insects in the western Negev.

2009– Doron Shulz (Y. Benayahu)
Sport fishing: ecological and economic implications.

2011–2017 Victor China (Holzman R.)
Hydrodynamics and Kinematics of prey capture in fish larvae

2011–2016 Rony Izhar (F. Ben-Ami)
The evolution of virulence under conditions of frequent multiple infections.

2011– Itay Berger (T. Dayan).
The influence of invasive Common Myna (*Acridotheres tristis*) on foraging and nesting behaviors of local *House Sparrow* (Passer domesticus).

2011– Orly Cohen (E. Geffen)
Selection variation among spadefoot toad tadpoles along the edge-core gradien.

2012–2017 Laurent Davin (D.E. Bar-Yosef Mayer, B. Valentin, F. Valla, and A. B. Cohen).
At the dawn of the Neolithic, societies of the southern Levant through their ornament acquisition, manufacture and use on Natufian sites.

2012–2017 Or Givan (Belmaker J.)
Commonness and rarity in Mediterranean fishes.

2012–2017 Elizabeth Morgulis (Dorchin, N. and A. Freidberg)
Phylogenetic classification of the genera *Acanthiophilus* Becker and *Tephritomyia* Hendel (Diptera: Tephritoidea: Tephritidae).

2012–2017 Maria Novosolov (S. Meiri and D. Orme).
Global lizard diversity.

2012–2017 Itai van Rijn (Belmaker J.)
The Seasonal growth and mortality in indigenous and invasive Mediterranean fishes.

2012–2017 Mey-Tal Yaniv (Shenkar, N.)
Early detection of non-indigenous ascidians along the Mediterranean coasts of Israel.

2012– Roee Maor (T. Dayan).
Evolutionary Trends in the Activity Patterns of Carnivores (Mammalia: Carnivora)

2012– Einat Shachar (Dorchin, N.).
Taxonomy and Ecology of oak gall wasps in Israel (Hymenoptera: Cynipidae)

2012– Bat-sheva (Shevy) Rothman (Goren M.)

The phylogeny of Monogenea (Platyhelminth) fish parasites.

2013–2017 Enav Vidan (Belmaker J. and Meiri S.)
Functional diversity drivers – Palaearctic lizards at multiple scales.

2013–2017 Gal Eyal (Y. Loya)
Biodiversity of Mesophotic (30-60 m depth) scleractinian corals in the Gulf of Eilat/Aqaba.

2013–2017 Yuval Itescu (S. Meiri and P. Pafilis).
Is evolution on islands special? Evolutionary pathways in an island lizard.

2013–2017 Oliver Tallowin (S. Meiri and A. Allison).
Evolution of reptiles along elevation gradients in a tropical island.

2013– Aviv Avisar (DayanT.)
Managing visitor impacts in the open landscapes of Israel.

2013– Maya Saar (Scharf, I.).
Foraging behavior and personality of *Messor* ants under field conditions.

2013– Lee Eyal- Shacham (Y. Loya)
Legislation of Marine Protected Areas in Israel: Mediterranean and Red Sea Reproductive strategies of deep reef (60 m depth) corals.

2013– Ya'arit Levitt- Barmatz (Shenkar N.)
Diversity and spatial distribution of *Caridea* species along the coasts of Israel

2013– Opher Mendelssohn (DayanT.)
Regional management of pest control.

2013– Sigal Orlansky (F. Ben-Ami)
The costs and benefits of resistance to parasites: The case of *Daphnia similis*.

2013– Tom Schlesinger (Loya, Y.)
Recruitment of stony corals at the coral reefs of Eilat.

2013– Zohar Yanai (Dorchin, N.).
The mayflies (Insecta: Ephemeroptera) of Israel: taxonomic and ecological aspects

2014– Tali Magoty Cohen (Dor R.)
Ecology and genetics of a recent avian invasive species in Israel

2014– Meoded, R. (M. Ilan and J. Piel))
Sponge secondary metabolite pathways

2014– Liat Koch (Holzman R.)
Functional morphology of the suction feeding mechanism in larval fishes

2014– Alex Slavenko (S. Meiri and A. Allison).
Macroevolution and macroecology of mountain reptiles.

2014– Yishai Weissman (E. Geffen)
Procaviidae vocalizations: From specific elements to phylogenetics.

2014– Dayana Yahalomi (D. Huchon)
Evolution of Myxozoan mitochondrial genomes.

2014– Stan Yavno (Holzman R.)
Functional morphology of the suction feeding mechanism in larval fishes

2015– Daniel Berkowic (Dor R., Sapir N. and Leshem Y.).
Movment ecology of overwintering black kites (*Milvus migrans)* in the North–West Negev.

2015– Hezi Buba (Belmaker J.)
Functional response in Mediterranean fishes.

2015– Yael Goll (E. Geffen)
Leadership in rock hyrax society.

2015– Tal Idan. (M. Ilan)
Mediterranean mesophotic sponge gardens

2015– Noa Katz (Scharf, I.).
Expression of AgRP in hydrodynamicly–starved fish.

2015– Yonatan Meresman (Ribak G.)
Evolution of wing elasticity in beetles (Coleoptera)

2016– Andressa Duran (S. Meiri and Dave Chapple).
Lizard macroecology.

2016– Ori Frid (Belmaker, J.)
Mediterranean fishes community structure

2016– Tal Gorgon (Shenkar, N.)
Polycarpa mytiligera as a model organism for regenerative studies

2016– Itai Granot (Belmaker, J.)
Community assembly and specialization across latitudinal gradients

2016– Ziv Kassner (Ribak G.)
The mechanics and behavior of aerial interception by insects

2016– Michaela Kolker (Holzman R. and S. Meiri)
Larval fishes in the Mediterranean of Israel

2016– Rona Nadler-Valency
Unfolding the diverse meanings, histories and conservation implications of human and wildlife 'co–habitation'.

2016– Itai Nodel (Sarig, R.)
Secondary dentin evaluation using computerized tomography: application for anthropology and forensics

2016– Renanel Pickholtz (Belmaker, J.)
Stress and movement patterns of fishes

2016– Raijman, L (M. Ilan)
Red Sea mesophotic sponges

2016 – Abra Spiciarich (Sapir–Hen L.).
Religious and Socioeconomic Diversity of Ancient Jerusalem and its Hinterland During the 8th–2nd century BC: A View from the Faunal Remains.

2016– Svetalana Vaisman (Dayan, T.)
Exotic and invasive molluscs in Israel (temporary title)
The mechanics and behavior of aerial interception by insects

2017– Tal Amit (Loya, Y.)
Ecology and physiology of coral symbiotic populations.

2017– Yohananoff, Gay (M. Ilan)
Measuring sponge filtration

2017– Rachel Schwarz (S. Meiri and Dave Chapple)
Habitat selection in reptiles

2017– Tomer Urca (Ribak G.)
The dispersal flight of (*Batocera rufomaculata*): The Biomechanics, Physiology and Ecology of a tree-boring beetle

MSc students

2011– Iris Wiseman (S. Meiri and M. Goren).
Overfishing in Israel.

2012–2017 Miri Zilka (Holzman R. and Eisenbeg E.)
The hydrodynamic basis of prey capture in low Re numbers

2013–2017 Davud Cumings (M. Goren)
The impact of water level and habitat composition and structure on reproduction of cichlids in Lake Kinneret.

2013– 2017 Camelia Gochev (Benayahu, Y. and G. Zilman).
Settlement of coral planulae in response to hydrodynamic conditions

2013– Or Ben-Zvi (Loya, Y.)
Fluorescence in shallow vs. deep water (mesophotic) corals.

2013- Yanir Klein (Dayan T. and Kronfeld-Schor N.)
Interspecific effects on spiny mouse reproduction.

2013– Olga (Dayan T. and Kronfeld-Schor N.)
Lead contamination in bats.

2013– Chen Piller (Benayahu, Y.).
Environment friendly antifouling paints: effiency and toxicity.

2013– Erez Shpirer (D. Huchon)
Identification of nematocyst–restricted genes in Myxozoa.

2013– Michal Zeitzov (Dayan T.)
Barn owls as biological control agents in the northern Negev.

2014–2017 Assaf Ben-David (Dayan T. and Itzhaki I.)
The effect of encroaching pine forests on birds in Ramat Hanadiv.

2014– 2016 Roy Ben Bezalel (F. Ben-Ami)
Parasite–mediated determinants of coexistence between sexual and asexual host snails.

2014–2017 Stav Brown (Ribak G.)
Effect of larval growth on scaling of dispersal flight in beetles.

2014–2017 Liran Dray (D. Huchon)
The complete mitochondrial genome of *Rhopalaea idoneta*.

2014–2017 Hila Dror (Shenkar, N.)
Characterizing bacterial communities in *Styela plicata* along the Mediterranean coast of Israel and the mid-western Atlantic coast.

2014–2017 Inbal Goldshtein (Dor R.)
Breeding ecology of terns in Isra.

2014–2016 Ophir Hirschberg (F. Ben-Ami)
Sinkholes as a source of life in the Dead Sea.

2014–2016 Maayan Itzhaki (F. Ben-Ami)
How biotic and abiotic factors affect the infectiousness and development of *Pasteuria ramosa*.

2014 –2017 Christina Jones (Sapir-Hen L., O. Lipschits and Y. Gadot)
Inter-Regional Connections during the Late Bronze Age as Reflected through the Animal Economy: Azekah– A Case Study.

2014–2017 Hadas Levin (May H.)
3D geometric–morphometric analysis of the proximal femur: Shape as a risk factor for degenerative changes of the hip and hip fracture

2014–2017 Nadine Santana-Magal (N. Dorchin)
Development of a molecular barcode for identification of immature stages of bark and wood beetles

2014 –2017 Lee Oz (Sapir-Hen L. and I. Finkelstein).
The Iron IIA in the Ophel excavations

2014–2016 Rachel Schwartz (S. Meiri and Panayiotis Pafilis).
Island traits and the evolution of traits in the gecko, *Mediodactylus kotschyi*

2014–2017 Weinberger, A (M. Ilan)
Bacterial symbionts the Red Sea sponge *Theonella swinhoei* and their role in Arsenic (As) metabolism

2014–2017 Yonatan Wexler (Scharf I.)
Personality and the effect of stress on personality in the red flour beetle as a model

2014– Lior Avidan (Holzman R.)
Assessment of fish community in the Northern Gulf of Aqaba (Eilat)

2014 – Mordechay Benzaquen (Langgut D. and I. Finkelstein).
The Archaeological Wood Remains of Tel Megiddo: Interpreting Environmental Conditions and Cultural Preferences Through the Analysis of Botanical Remains.

2014– Bar Feldman (Loya, Y.)
Reproductive strategies of selected mesophotic corals vs. shallow corals.

2014– Naomi Gordon (E. Geffen)
Vocal repertoire in female rock hyraxes in relation to social structure.

2014– Mila Grinblat (Loya, Y.)
Connectivity between mesophotic corals and shallow corals.

2014– Noa Keidar (N. Dorchin)
The role of enemy reduced space in host-associated differentiation of gall inducing midges.

2014– Tzlil Labin (Dayan T. and Kronfeld–Schor N.)
Light pollution in a desert community.

2014– Liraz Levi (Holzman R.)
Quantifying suction flows in larval fishes.

2014– Tal Rubin (Dayan T. and Kronfeld-Schor N.)
Urban Bats.

2014– Gila Hanuca (A. Hefez)
Instar-related development of *Cales noacki*.

2015–2017 Idan Doyev (Belmaker J.)
Comparing traits of invasive fishes in introduced and native ranges.

2015–2017 Inbal Gamliel (Belmaker J. and Gil Rilov)
Biotic interactions and resilience to climate change in intertidal invertebrates

2015–2017 Chen Gilboa (F. Ben-Ami)
Evolution of parasite virulence and host resistance strategys with parasitism.

2015–2017 Ben Laugomer (Langgut D, M. Bar-Matthews and I. Finkelstein)
Paleoclimate in the southern Levant during the Bronze and Iron Ages based on isotop compasition in Soreq Cave speleothems

2015–2017 Guy Sinaiko (S. Meiri and R. Dor)
Taxonomy and phylogeny of slender racers of the *Platyceps rhodorachis* complex.

2015–2017 Hagar Yancovitch shalom (Belmaker J)
Abundance–range size relationships in reef fishes

2015–2017 Ronni Zafriri (Shenkar, N.)
The solitary ascidians *Microcosmus exasperatus* (order: Stolidobranchia), and *Phallusia nigra* (order: Phlebobranchia) as potential bio-indicators of marine environments

2015– Hanan Arafat (D. Huchon)
The complete mitochondrial genome of *Rhopalaea idoneta*.

2015– Adi Ashkenazi (M. Ilan)
Mediterranean Stryphnus from the deep sponge garden

2015– Mark Cavanagh (Langgut D. and E. Ben Yosef)
An Anthracologic Investigation into Fuel Sources at the Iron Age Copper Smelting Site of Timna 34

2015 – Iris Hershko (Sarig R.).
Characterization of hunter-gatherers, early farming communities and modern populations in the Levant based on dental morphological traits and micro CT analysis.

2015 – Roni Hofein (D.E. Bar-Yosef Mayer, Oded Lipschits)
The beads from Tel Azekah as a tool for dating and understanding the cultural, economic and trade connections at the site.

2015– Corrine Jacobs (Holzman R.)
The evolution of suction flows in ray-finned fish

2015– Simon Jamison (S. Meiri and R. Dor)
Natural history of little known Israeli reptiles.

2015– M Levi (M. Ilan)
Mediterranean Irciniids from the deep sponge garden.

2015 – Helena Roth (Langgut D. and Y. Gadot).
Wood economy and botanical reconstruction of Early Roman Jerusalem.

2015– Jamie Shapiro (D.E. Bar-Yosef Mayer, Ehud Spanier)
Changes in the Food Habits and possible competition of the mango tilapia, Sarotherodon galilaeus, and of the silver carp.

2016–2017 Nir Netanel (M. Ilan and E. Zchori-Fein)
Microsymbionts of *Bemisia*.

2016–2017 Yohananoff, G. (M. Ilan)
Sponge filtration.

2016– Ella Avidor (E. Geffen)
Characterizing habitat requirements and occupancy of the Hula painted frog.

2016– Michael Bar-Ziv (Scharf I.)
Comparison between urban and natural populations of trap–building predators.

2016– Darar Bega (Scharf I.)
To be determined.

2016– Nir Bonda (N. Dorchin)
The role of natural enemies in host–associated speciation of gall-inducing midges (Diptera: Cecidomyiidae)

2016– Aviv Ben-Tal (Shenkar, N.)
Ascidian mucous mesh

2016– David David (S. Meiri and S. Gafny)
Captive breeding and the conservation of *Pelobates syriacus*.

2016– Hilla Davidovich (Ribak G.)
Biomechanics and mate selection in the copulatory flight of damselflies

2016– Shirad Galmour (Sapir-Hen L.).
The early Neolithic at Ahihud: hunters, farmers, and the rest

2016– Tal Gavriely (Belmaker J.)
Fish movement ecology.

2016– Tomer Gilad (Scharf I.)
Effect of climate conditions on dispersal and population dynamics in the red flour beetle.

2016– Or Greber (Ribak G. and Ayali A.)
Neurophysiology and mechanics of aerial righting in locusts.

2016– Or Keissar (Scharf I.)
Predator-induced changes in vector traits, and their cascading effects on the spread of plant viruses.

2016– Yuly Marom (Sarig, R.)
Taxonomic characterization of hominin in the Kebara Cave in relation to Dentition.

2016 Heeli Schechter (D.E. Bar-Yosef Mayer, Nigel Goring-Morris)
PPNB shell beads of northern Israel.

2016– Gavin Stark (S. Meiri)
Comparative reptile longevity.

2016– Shoam, S. (M. Ilan)
Arsenic tolerant bacteria from sponges.

2016– Amir Sarig (Ribak G.)
Flight Biomechanics and direction preference of miniature insects in wind conditions.

2016– Gal Vered (Shenkar, N.)
Ascidians as bio-indicators of micro–plastic and phthalates in marine environments.

2016– Gal Navon (Shenkar, N.)
Influence of pharmaceutical residuals on benthic filter feeders.

2017– Barel Asraf (F. Ben-Ami)
The significance of multiple infections for the host population.

2017– Anna Azem (F. Ben-Ami)
The significance of host age in host–parasite coevolution.

2017– Ben Dor Cohen E. (M. Ilan and O. Yarden)
Mesophotic sponge associated fungi.

2017– Guillermo F. Anderson Benaim (E. Geffen)
To be determined.

2017– Hadar Elazar (S. Meiri and R. Dor)
Common Myna behavior in invasion core versus invasion front.

2017– Moskovich, R. (M. Ilan and G. Yahel)
Sponge filtration mechanism.

2017– Adva Olga Peretz (S. Meiri and Nimrod Merom)
The water vole in Israel: from archaeology to extinction to reintroduction?

2017– Olga Rybak (S. Meiri and R. Dor)
Breeding biology and conservation of Little and Common Terns in Israel.

Post-doctoral fellows

2011– Razi Hofman

2013–2017 Meirav Meiri, Mobility and Societal Change in the Eastern Mediterranean in the Late Bronze and Early Iron Ages

2013–2017 Noga Sokolover

2014 – Karin Tamar, Taxonomy and phylogeny of Saharo-Arabian reptiles

2014–2017 Gidi Pizanty, Systematics, evolution and ecology of bees (Hymenoptera: Apiformes), with a focus on the genus Andrena

2015– Guy Sion, Laterality in gecko brains – relationships with behaviour and morphology

2016–2017 Jenny Tynyakov, Anthropogenic influences on fish behavior

2016– T. Tunis-Sella, The evolutionary history of the human chin

2016– Liron Goren, The diversity of Sponge-inhabiting Polychaeta in Israel

2016– Shane Blowes, Scale-dependencies in the drivers of large-scale diversity gradients

2016– Iris Bernstein, Ecological tools and their applications for integrating biodiversity aspectes in land-use planning

2016– Ronit Justo-Hanani, Understanding ecological policy innovation in the eu: science and politics in the new bio-invasion legislation and management reform.

2017– Orr Comay, Mountainous Levantine micromammal communities as tools paleoecology: implications for Manot Cave

2017– Yuval Itescu, Taxonomy and ecology of *Echis coloratus*

2017– Rony Izhar, Taxonomy and diversity of the trematodes in freshwater snails

VISITING SCIENTISTS AT THE STEINHARDT MUSEUM OF NATURAL HISTORY

The attached list includes visitors from institutions **other than** Tel Aviv University, who came personally to use the natural history collections of the Tel Aviv University during the past academic year. Much use is made of the collections by other scientists, who did not visit them in person. Some scientists got identification services for their research projects and others had lists of specimens and locations mailed to them for various types of research. Moreover, during this period numerous parcels containing scientific materials were mailed abroad to researchers at their home institutions.

Date	Name	Institute	Country	Taxonomic group
2016 Nov	A. Shabtai	Technion	Israel	Invertebrate
2016 Nov	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2016 Nov	D. Korngreen	Geological Survey Israel	Israel	Foraminifera
2016 Oct	D. Magen		Israel	Birds
2016 Oct	Y. Cherka	KKL	Israel	Birds
2016 Dec	A. Turchetti-Maia	Hebrew University	Israel	Molluscs
2016 Dac	D. Korngreen	Geological Survey Israel	Israel	Foraminifera
2016 Dec	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2016 Dec	A. Ben David		Israel	Mammals
2016 Dec	Y. Kiat	Birding Center in Jerusalem	Israel	Birds
2017 Jan	S. de Waart	Leidan	Holland	Flatworms
2017 Jan	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2017 Jan	A. Turchetti-Maia	Hebrew University	Israel	Molluscs
2017 Jan	H. Reshef	Haifa University	Israel	Mammals
2017 Jan	H. Mizrahi		Israel	Birds
2017 Feb	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2017 Feb	D. Korngreen	Geological Survey Israel	Israel	Foraminifera
2017 Feb	W. Neser	African vulnres. org	South Africa	Scorpions
2017 Feb	Donald LJ Quicke	Chulalongkorn University	Thailand	Entomology
2017 Feb	P. Weintraub	Gilat Research Center	Israel	Entomology
2017 Mar	A. Turchetti-Maia	Hebrew University	Israel	Molluscs
2017 Mar	P. Krusanov	Palais de Rumine	Switzerland	Entomology
2017 Mar	J.L. Gattoliar	Herzen University	Russia	Entomology
2017 Mar	V. Lukhtanov	Zoological Institute	Russia	Entomology
2017 Mar	E. Pazhenkova	Zoological Institute	Russia	Entomology

Date	Name	Institute	Country	Taxonomic group
2017 Mar	T. Assman	Lueneburg University	Germany	Entomology
2017 Mar	G. Wagner	Hamburg	Germany	Entomology
2017 Apr	N. Van der Hal	Haifa University	Israel	Fish
2017 Apr	N. Bruyniks	Cardiff University	UK	Sponges
2017 Apr	P. G. Albano	University of Vienne	Israel	Molluscs
2017 Apr	R. Kelly	University of Bristol	UK	Entomology
2017 May	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2017 May	P. G. Albano	University of Vienne	Israel	Molluscs
2017 May	I. Ktalav	Haifa University	Israel	Molluscs
2017 May	R. Fricke	Stutgart Museum	Germany	Fish
2017 May	D. Golani	Hebrew University	Israel	Fish
2017 May	Y. Kiat	Birding Center in Jerusalem	Israel	Birds
2017 May	I. Ktalav	Haifa University	Israel	Mammals
2017 May	J. Daujat	University of Nottingham	UK	Mammals
2017 May	M. Just	Trutnov	Czech Republic	Entomology
2017 May	M. Wysoki	Volcani Center	Israel	Entomology
2017 May	Z. Mendel	Volcani Center	Israel	Entomology
2017 May	A. Protasov	Volcani Center	Israel	Entomology
2017 May	A. F. Karakostis	University of Tuebingen	Germany	Anthropology
2017 Jun	D. Ben-Natan		Israel	Molluscs
2017 Jun	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2017 Jun	T. Atar		Israel	Birds and Mammals
2017 Jun	H. Rubin	Scientific and Technological Center	Israel	Entomology
2017 Jun	C. Hauser	Museum fur Naturkunde	Germany	Entomology
2017 Jun	S. Miller	Smithsonian Institution	USA	Entomology
2017 July	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2017 July	H. Shirichai	University of Gothenburg	Sweden	Birds
2017 July	Y. Kiat	Birding Center in Jerusalem	Israel	Birds
2017 July	N. Kavva	Birding Center in Jerusalem	Israel	Birds
2017 July	A. Nissia	Birding Center in Jerusalem	Israel	Birds
2017 Aug	S. Vaisman	Ministry of Agriculture	Israel	Molluscs

Date	Name	Institute	Country	Taxonomic group
2017 Aug	Y. Fux Galitsky		Israel	Molluscs
2017 Aug	A. Turchetti-Maia	Hebrew University	Israel	Molluscs
2017 Aug	Y. Cherka	KK"L	Israel	Birds
2017 Aug	N. Marom	Haifa University / Tel Hai	Israel	Mammals
2017 Aug	A. Peretz	Tel Hai	Israel	Mammals
2017 Aug	S. Zedek	Tel Hai	Israel	Mammals
2017 Aug	L. Orbach	Haifa University	Israel	Mammals
2017 Sep	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2017 Oct	D. Shilo	Israel Nature and Parks Authority	Israel	Mammals
2017 Oct	A. Tsoar	Israel Nature and Parks Authority	Israel	Mammals
2017 Oct	Y. Kiat	Birding Center in Jerusalem	Israel	Birds

SUPPORT FOR ACADEMIC AND OTHER COURSES

The natural history collections are university-based and as such, their role is also to promote higher education. Some courses are TAU-based, several of which are compulsory for first and second year students and are taught to hundreds of them. However, other universities (Technion, University of Haifa, Open University) use our facilities for their specialized courses, as does the Avshalom Institute. Many Nature Campus activities also take place using the collections for varied audiences.

Purpose	Name	Institute	Taxonomic group
Faunistics of Aves (academic course)	R. Dor and E. Geffen	Tel Aviv University	Mammals, Taxidermist and Museum Class
Insects the Flagship of Biodiversity (academic course)	A. Freidberg, Dorchin, N. and D. Simon	Tel Aviv University	Entomology
Parasitoids (academic course)	D. Gerling	Tel Aviv University	Entomology
Macroecology (academic course)	S. Meiri	Tel Aviv University	Birds, Mammals and Reptilia
Introduction to animal life – vertebrates (academic course)	S. Meiri	Tel Aviv University	Birds, Mammals and Reptilia
Zoological Garden and Natural History Museum tours (academic course)	S. Meiri	Tel Aviv University	Birds, Mammals and Reptilia
Introduction to Animal Kingdom: Invertebrates and Vertebrates (academic course)	A. Abelson and S. Meiri	Tel Aviv University	Mammals
Introduction to Archaeozoology	L. Sapir-Hen	Tel Aviv University	Mammals
Practical workshop in Archaeozoology	L. Sapir-Hen	Tel Aviv University	Mammals, Fish and Museum Class
Animal remains in archaeology	L. Sapir-Hen	Tel Aviv University	Mammals
Vertebrates Anatomy (academic course)	D. Eilam	Tel Aviv University	Reptilia, Mammals and Taxidermist
The Invertebrates: Comparative Functional Biology (academic course)	M. Ilan, Y. Benayahu and N. Shenkar	Tel Aviv University	Invertebrates, Entomology and Histology
Ichthyology (academic course)	M. Goren	Tel Aviv University	Fishes and Museum Class
Trips in the experimental zoo and Natural History Museum (academic course)	T. Dayan	Tel Aviv University	Birds, Mammals and Reptilia

Purpose	Name	Institute	Taxonomic group
Biology and Systematic of Marine Invertebrates: (academic course)	Y. Benayahu	Interuniversity Institute for Marine Sciences	Invertebrates
Topics in Fish Biology (academic course)	R. Holzman and M. Kiflawi	Interuniversity Institute for Marine Sciences	Fishes
Osteology And Anthropology (academic course)	I. Hershkovitz	Tel Aviv University	Anthropology
Physical Anthropology (academic course)	Y. Rak	Tel Aviv University	Anthropology
Chapters in Human Evolution (academic course)	Y. Rak	Tel Aviv University	Anthropology
Human Evolution: fossil evidences (academic course)	Y. Rak	Tel Aviv University	Anthropology
Dental Anthropology (academic course)	R. Sarig	Tel Aviv University	Anthropology
From gatherers to eradicators? (academic course)	D. Langgut	Tel Aviv University	Palynology and Archaeobotany
Plants of the Bible (academic course)	D. Langgut	Tel Aviv University	Palynology and Archaeobotany
Reconstruction of past environmental conditions and site's environs (academic course)	D. Langgut	Tel Aviv University	Palynology and Archaeobotany
Museology (academic course)		Tel Aviv University	Mammals, Birds, Entomology and Museum Class
Outstanding program of arts (academic course)		Tel Aviv University	Mammals, Birds, Entomology and Museum Class
Veni Vidi Tuli: Cabinets of Wonder – Curiosity and Collections in 16th and 17th Century Europe (academic course)	T. Cholcman	Tel Aviv University	Mammals, Birds, Entomology and Museum Class
Viruses & How to Beat Them (academic course)	J. Gershoni	Tel Aviv University	Museum Class
Faunistics (academic course)	Z. Arad	Technion	Birds, Mammals and Museum Class
Vertebrates (academic course)	S. Barkan	Open University	Birds, Mammals and Museum Class

Purpose	Name	Institute	Taxonomic group
Bird-Watching		Israeli Air Force	Birds and Museum Class
Bird-Watching		The Society for the Protection of Nature in Israel	Mammals, Birds and Museum Class
Various seminars	Nature Campus	Tel Aviv University	Mammals, Birds, Entomology and Museum Class
Guided tours to schoolchildren	Nature Campus	Tel Aviv University	Mammals, Birds, Entomology and Museum Class

SERVICE PROVISION TO INDIVIDUALS AND ORGANIZATIONS

The Steinhardt Museum of Natural History functions as a national facility by providing services to the scientific community, other organizations and, to the best of our ability under currently constrained conditions, to the general public. Below we list **a sample** of the services provided by the collections during the past academic year. The list is not exhaustive, for under the current condition of under-staffing we are unable to monitor and record all such activities.

Purpose	Name	Institute	Taxonomic group
Taxonomic guidance (learning the procedure)	V. Sepliarsky	Plant Protection and Inspection Services	Entomology
Taxonomy Identification		Plant Protection and Inspection Services	Entomology
Taxonomy Identification		Israel Nature and Parks Authority	Entomology
Taxonomy Identification		Ministry of Environmental Protection	Entomology
Taxonomy Identification		Ministry of Health	Entomology
Taxonomy Identification		Ministry of Agriculture	Entomology
Taxonomy Identification		Israel Defense Forces	Entomology
Taxonomy Identification		Hebrew University	Entomology
Taxonomy Identification		Porter School for Enviromental Sciences	Entomology
Taxonomy Identification		Ben Gurion University	Entomology
Taxonomy Identification		The Israel National Aquatic Ecology Center	Entomology
Taxonomy Identification		Ministry of Agriculture	Arachnidae
Taxonomy Identification	E. van dan Brink	Israel Antiquity Authority	Molluscs
Taxonomy Identification	S. Vaisman	Plant Protection and Inspection Services	Molluscs
Taxonomy Identification	A. M. Maeir	Israel Antiquity Authority	Molluscs
Taxonomy Identification	O. Tal	Israel Antiquity Authority	Molluscs
Taxonomy Identification	Z. Dvira	Israel Antiquity Authority	Molluscs
Taxonomy Identification	I. Hirschfeld	Israel Antiquity Authority	Molluscs
Taxonomy Identification	S. Dar	Israel Antiquity Authority	Molluscs
Taxonomy Identification	O. Gutfeld	Israel Antiquity Authority	Molluscs
Taxonomy Identification	N. Avigad	Israel Antiquity Authority	Molluscs

Purpose	Name	Institute	Taxonomic group
Taxonomy Identification	H. Geva	Israel Antiquity Authority	Molluscs
Taxonomy Identification	E. Sheffer	IOLR – Haifa	Molluscs
Taxonomy Identification	H. Lubinevsky	IOLR – Haifa	Molluscs
Taxonomy Identification	B. Rinkevitch	IOLR – Haifa	Molluscs
Taxonomy Identification	D. Milstein	Israel Nature and Parks Authority	Molluscs
Taxonomy Identification	Enforcement District	Israel Nature and Parks Authority	Molluscs
Taxonomy Identification	North District	Israel Nature and Parks Authority	Molluscs
Taxonomy Identification	R. Yahel	Israel Nature and Parks Authority	Molluscs
Taxonomy Identification	A. Dotan		Molluscs
Taxonomy Identification	E. Elron		Molluscs
Taxonomy Identification	Y. Achitov	Bar Ilan University	Invertebrates: Stony Corals
Taxonomy Identification	N. Stern	IOLR – Haifa	Crustacean
Taxonomy Identification	D. Milstein	Israel Nature and Parks Authority	Crustacean
Taxonomy Identification	Y. Achitov	Bar Ilan University	Crustacean
Taxonomy Identification	A. Weissman	Haifa University	Crustacean
Taxonomy Identification	E. Elron	DHV MED	Crustacean
Taxonomy Identification	H. Lubinevsky	Israel Oceanographic and Limnological Research	Crustacean
Taxonomy Identification	O. Barnea	Marine biology consulting services	Crustacean
Taxonomy Identification		IOLR – Haifa	Fishes
Taxonomy Identification	R. Yahel	Israel Nature and Parks Authority	Sponge
Taxonomy Identification		Ma'arag	Sponge
Taxonomy Identification	S. Martinez	University of Haifa	Sponge
Taxonomy Identification	E. Mils	CSA OceanSciences Inc.	Sponge
Taxonomy Identification	R. Yahel	Israel Nature and Parks Authority	Bryozoa
Taxonomy Identification	R. Yahel	Israel Nature and Parks Authority	Ascidians
Taxonomy Identification	S. Martinez	University of Haifa	Ascidians
Taxonomy Identification	R. Yahel	Israel Nature and Parks Authority	Echinodermata
Taxonomy Identification	R. Yahel	Israel Nature and Parks Authority	Algae
Taxonomy Identification	R. Yahel	Israel Nature and Parks Authority	Fishes
Taxonomy Identification	D. Milstein	Israel Nature and Parks Authority	Amphibian

Purpose	Name	Institute	Taxonomic group
Taxonomy Identification		Israeli Air Force	Mammals
Taxonomy Identification		Israel Nature and Parks Authority	Mammals
Taxonomy Identification		Israeli Air Force	Birds
Taxonomy Identification		Israel Airport Authority	Birds
Taxonomy Identification		Israel Nature and Parks Authority	Birds
Molecular identification	D. Milstein	Israel Nature and Parks Authority	Fishes
Molecular identification		Israeli Air Force	Birds
Molecular identification		Israel Airport Authority	Birds
Molecular identification	E. Mils	CSA Ocean Sciences Inc.	Sponge
Molecular identification	G. Shenbrot	Ben-Gurion University	Reptilia
Molecular identification	D. Milstein	Israel Nature and Parks Authority	Crustacean
DNA Shipment	S. Prost	Berkeley, USA	Mammalia
DNA Shipment	D. Jablonski	University in Bratislava Mlynská dolina Slovakia	Reptilia
DNA Shipment	P. Kornilios	Democritus University of Thrace, Greece	Reptilia
Electronic Data	D. Milstein	Israel Nature and Parks Authority	Fishes
Electronic Data	Z. Amar	Bar Ilan University	Entomology
Electronic Data	H. Shirichai	University of Gothenburg, Sweden	Birds
Electronic Data	E. Ezov	Open University	Birds
Electronic Data	G. Bar-Oz	Haifa University	Mammals
Electronic Data	E. Bar Ziv	Ben Gurion University	Mammals
Electronic Data	E. Bigal	Haifa University	Mammals
Electronic Data	N. Marom	Haifa University	Mammals
Electronic Data	L.A.A. Janssens	Haifa University	Mammals
Electronic Data	A. Arnon	Yad Hanadiv	Mammals
Electronic Data	B. Shacham	Hebrew University	Reptilia
Electronic Data	R. Talbi	Israel Nature and Parks Authority	Reptilia
Shipment of Specimens	S. Goldberg	Whittier College, USA	Reptilia
Shipment of Specimens	A. Aylon	Israel	Reptilia
Shipment of Specimens	N. Sfenthourakis	Israel	Reptilia
Shipment of Specimens	P. Kornilios	Democritus University of Thrace, Greece	Reptilia

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	D. Jablonski	University in Bratislava Mlynská dolina Slovakia	Reptilia
Shipment of Specimens	R. Talbi	Israel Nature and Parks Authority	Reptilia
Shipment of Specimens	E. Mori	Università degli Studi di Siena, Italy	Mammals
Shipment of Specimens	A.M.R. Bezerra	Museu Paraense Emilio Goeldi, Brazil	Mammals
Shipment of Specimens	P. Soisook	Prince of Songkla University, Thailand	Mammals
Shipment of Specimens	S. Barkan	Open University	Mammals
Shipment of Specimens	P. Cardenas	Uppsala University, Sweden	Sponges
Shipment of Specimens	D. Vianney		Soft Corals
Shipment of Specimens	M. Bo	National Taiwan University, Taipei, TAIWAN	Soft Corals
Shipment of Specimens	B. Reijnen	Università degli Studi di Genova, Italy	Soft Corals
Shipment of Specimens	C.S. McFadden	Naturalis Biodiversity Centre, The Netherlands	Soft Corals
Shipment of Specimens	L. van Ofwegen	Harvey Mudd College, USA	Soft Corals
Shipment of Specimens	D. Reimer	National Museum of Natural History, Leiden, The Netherlands	Soft Corals
Shipment of Specimens	Szénási	Hungary	Entomology
Shipment of Specimens	Gattoliat	Musée cantonal de zoologie, Switzerland	Entomology
Shipment of Specimens	Gusenleitner	Biologiezentrum Linz, Austria	Entomology
Shipment of Specimens	Rozen	American Museum of Natural History, USA	Entomology
Shipment of Specimens	Brady	Smithsonian Institution, St. Petersburg, USA	Entomology
Shipment of Specimens	Schmidt	Zoologische Staatssammlung, Germany	Entomology
Shipment of Specimens	Taylor	UK	Entomology
Shipment of Specimens	Cerny	Czech Republic	Entomology
Shipment of Specimens	Wolf	Chulalongkorn University, Thailand	Entomology

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	Casale	Universita di Sassari, Italy	Entomology
Shipment of Specimens	Guéorguiev	National Museum of Natural History, Bulgaria	Entomology
Shipment of Specimens	Scheuchl	Germany	Entomology
Shipment of Specimens	Szadziewski	University of Gdansk, Poland	Entomology
Shipment of Specimens	Evenhuis	Bishop Museum, USA	Entomology
Shipment of Specimens	Boyadzhiev	University of Plovdiv "Paisii Hilendarski", Bulgaria	Entomology
Shipment of Specimens	Knutson	Italy	Entomology
Shipment of Specimens	Tedeschi	Italy	Entomology
Shipment of Specimens	Barber-James	Albany Museum, St. Petersburg, South Africa	Entomology
Shipment of Specimens	Douglas	Arachnids and Nematodes, Agriculture and Agri-Food Canada, Canada	Entomology
Shipment of Specimens	Kundrata	Palacky University, Czech Republic	Entomology
Shipment of Specimens	Nieser	Naturalis Biodiversity Center, UK	Entomology
Shipment of Specimens	Snegovaya	National Academy of Sciences of Azerbaijan, Azerbaijan	Entomology
Shipment of Specimens	Palevsky	Newe-Ya'ar Research Center, Ministry of Agriculture, Israel	Entomology
Shipment of Specimens	Tsolakis	University of Palermo, Italy	Entomology
Shipment of Specimens	Mendel	Volcani Center, ARO, Israel	Entomology
Shipment of Specimens	Zielke	Bulgarian Academy of Sciences, Bulgaria	Entomology
Shipment of Specimens	Gibbs	UK	Entomology
Shipment of Specimens	Grichanov	Institute of Plant Protection, VIZR, Russia	Entomology
Shipment of Specimens	Askew	France	Entomology
Shipment of Specimens	Sesega	Université De Mons, Belgium	Entomology
Shipment of Specimens	Norrbom	Systematic Entomology Laboratory, NMNH, USA	Entomology
Shipment of Specimens	Cardinal	Agriculture and Agr-Food Canada, Canada	Entomology
Shipment of Specimens	Kocher	Princeton University, USA	Entomology
Shipment of Specimens	Ozsoy	Colorado Mesa University, USA	Entomology

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	Barták	Department of Zoology and Fisheries, Czech Republic	Entomology
Shipment of Specimens	Winkelmann	Germany	Entomology
Shipment of Specimens	Poltavsky	Rostov-on-Don University, Russia	Entomology
Shipment of Specimens	Háva	Czech University of Life Sciences, Czech Republic	Entomology
Shipment of Specimens	Balke	Zoologische Staatssammlung, Germany	Entomology
Shipment of Specimens	Langer	Germany	Entomology
Shipment of Specimens	Hiermeier	Zoologische Staatssammlung, Germany	Entomology
Shipment of Specimens	Pauly	Institut royal des Sciences naturelles de Belgique, Belgium	Entomology
Shipment of Specimens	Schwarz	Austria	Entomology
Shipment of Specimens	Dorchin	Hebrew University, Israel	Entomology
Shipment of Specimens	Pisanty	Agriculture and Agri-Food Canada, Canada	Entomology
Shipment of Specimens	Terzo	University of Mons, Belgium	Entomology
Shipment of Specimens	Mueller	ETH Zurich, Switzerland	Entomology
Shipment of Specimens	Dathe	Deutsches Entomologisches Institut, Germany	Entomology
Shipment of Specimens	Salata	University of Wroclaw, Poland	Entomology
Shipment of Specimens	Nel	Sorbonne Universites, France	Entomology
Shipment of Specimens	Roth	University Museum of Bergen, Norway	Entomology
Shipment of Specimens	Skartveit	NLA University College Bergen, Norway	Entomology
Shipment of Specimens	Haran	Orléans University, France	Entomology
Shipment of Specimens	Bowie	Life Sciences Building, USA	Entomology
Shipment of Specimens	Chamorro	Smithsonian National Museum of Natural History, USA	Entomology
Shipment of Specimens	Riley	Texas A&M University, USA	Entomology
Shipment of Specimens	Kostal	Czech Republic	Entomology
Shipment of Specimens	Zeegers	Naturalis, Leiden, The Netherlands	Entomology
Shipment of Specimens	Kolcsár	Babes-Bolyai University, Romania	Entomology
Shipment of Specimens	François	France	Entomology