The National Collections of Natural History at Tel Aviv University

2011/2012 Scientific Report

Submitted to the Steering Committee for the National Collections of Natural History, the Israel Academy of Sciences and Humanities

The website of The National Collections of Natural History, Tel Aviv University:
http://mnh.tau.ac.il/index.php

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Introduction

The academic year 2011/2012 was the 8th in which the natural history collections at Tel Aviv University enjoyed VATAT regular support. It was also the 5th year that the collections enjoyed the invaluable special support for training and collections improvement and the 5th year that the collections enjoyed the support of the Ministry of Science and Technology, having been declared a Knowledge Center by the ministry. In addition, it was the 3rd year of operation of the Israel Taxonomy Initiative, a national project to promote basic biodiversity research. Consequently, in terms of training, collections care and improvement, we continued to take significant steps to promote the collections as a research infrastructure and to promote collections-based research.

Progress with building a proper facility to house our collections and collections-based activities continues following the hiatus caused by governance issues at TAU. The pit for the underground parking lot and the building foundations was excavated and the building skeleton contractor is hard at work. We anticipate that the building will be finished within ca. 2.5 years. We remain extremely grateful to our donors, the government ministries, and VATAT for making this possible, and for staying with us patiently to see this project through.

Our report focuses only on academic achievements made with the use of the natural history collections at TAU during the academic year 2011/2012. This use ranges from biogeographic collections-based research, to tissue samples for ancient DNA zooarcheological research. In some studies it was the taxidermist who provided support for scientific research. In many others the chief contribution was taxonomic identifications carried out by the curators and collections managers, who regularly support much basic and applied research. The latter support is becoming increasingly significant as we are increasingly called upon to provide the support and knowledge inherent in the collections and staff.

In the past year 399 scientists used our collections for research, a 60% and steady increase since 6 years ago (see Table below). Of these only ca. 60% of users are affiliated with TAU while the remainder come from various academic institutions in Israel and abroad and from government agencies and even the industry. VATAT support has been crucial in improving the collections as a research infrastructure and center of expertise and we look forward to a further improvement with the new funding model.

The Israel Taxonomy Initiative, aimed to train the new generation of taxonomists in Israel and to promote biodiversity surveys, began its operation three years ago. This initiative is funded by a philanthropic foundation with matching funds from the Ministry of Environmental Protection, the Ministry of Agriculture, the Ministry of Infrastructures, KKL, and the universities. Currently 11 PhD students in Taxonomy are supported by ITI and every year taxonomy courses bring knowledge of species-rich and economically or environmentally important taxa to Israel, to the benefit of both graduate students and professionals in government agencies. Two of the first three post-docs are now scientists at Tel Aviv University and at the Kinneret Research Laboratory of IOLR and the third is a post-doc at TAU. The combination of VATAT support for training in collections-based research and the Israel Taxonomy Initiative is going a long way towards mitigating years of neglect, but much work is still needed.

In the past year two new curators joined us: Dr. Netta Dorchin was recruited by the Department of Zoology and is now our Curator of Entomology. Dr. Roi Holtzman of the Department of Zoology at the Interuniversity Research Institute at Eilat is now Curator of Red Sea Fishes. In October 2012 Dr. Jonathan Belmaker joined the Department of Zoology and is now our Curator of Mediterranean Fishes; Dr. Noa Shenkar was also hired by Zoology and is now our Curator of Invertebrates (Ascidians); Dr. Dafna Langgut was hired by the Institute of Archeology and is now our Curator of Palynology and

Archeobotany; Dr. Inon Scharf joined Zoology and serves as Associate Curator of Entomology. These young and promising curators and scientists are a huge boost to our project, and highlight the relevance and significance of natural history collections to various aspects of biodiversity research.

Naturally, the focus of the report is on activities carried out within Tel Aviv University. Many colleagues from other universities within and without Israel use the collections for research and teaching, but we did not necessarily manage to receive all relevant materials from them in time for this report, so there is significantly more scientific activity than can be discerned from the present report.

Summary of collections-based activities 2006-2012

Activity	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12
Number of TAU scientists who used the collections for research	45	47	54	58	61	67
Number of other scientists who used the collections for research	142	138	157	164	211	239
Number of graduate students who used the collections for research	63	71	75	73	84	93
Number of refereed articles of research who used the collections	171	235	209	222	206	237
Number of scientific books based on the collections	11	7	10	3	3	8
Number of courses that used the collections	21	20	19	21	22	25
Number of participants in 'Nature Campus' activities	10,800	7,020	7,926	10,312	10,363	
Number of entries to 'Natural History Collections' website (starting 2009/10)	---	---	---	9,900	10,700	11,700
Number of entries to 'Nature Campus' website (starting 2009/10)	---	---	---	26,100	26,500	27,800
Number of entries to 'EarthWeb' website (starting 2009/10)	---	---	---	15,500	15,100	20,600

Progress in the natural history collections

Natural history collections are dynamic archives that record biodiversity. As such, they grow annually by new collecting activities and by incorporating smaller private or institutional collections. The collecting activities comprise focused collecting expeditions as well as the products of numerous field studies carried out by scientists and their graduate students. Moreover, the Israel Nature and Parks Authority rangers collect vertebrate carcasses for the collections. Collecting, incorporating the collections, preserving and digitizing them, as well as managing the collections, the data, and the network of collectors and colleagues, is a formidable job 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 the nearly impossible physical conditions, to preserve and expand this priceless record of biodiversity, and to help 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 are the crucial backbone of the national collections of natural history at Tel Aviv University.

Our collections managers have also produced this report, and we are particularly grateful to the work of Revital Ben-David-Zaslow in compiling it. Here they they provide a glimpse of the behind-the-scenes of managing the collections: collections news, collecting trips and expeditions, and new collections are reported here in a nutshell.

Collections News – A word from our collection managers

Throughout the past year the staff members of the TAU Natural History Collections have continued their day-to-day activities. We continue to collect and preserve new scientific materials, rescue and incorporate important private and historical collections, maintain the existing collections, ship scientific material and data to those requesting them, and assist graduate students, academic courses, and "Nature Campus" activities.

During the academic year 2011/2012 we received and incorporated many specimens of various taxonomic groups collected worldwide by the curators and staff, students, rangers from the Israel Nature and Parks Authority, and others. Almost 30,000 new specimens were added to the various collections during this year.

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 for molecular analysis were taken from most of the soft coral specimens and preserved. Almost 250 new specimens of soft corals were added this year.

Everyday work on the insect collection includes the absorption and integration of donated collections; labeling and sorting of specimens from collecting trips; identification of and research on select groups (including over 90 shipments of scientific specimens to specialists, mostly overseas, during 2012); and preservation activities, such as renewal of naphthalene. Special treatment is required in cases of damage caused by mold and pests. As in past years, we have continued digitizing this collection. Newly-caught insects are immediately given a catalog number and digitized. During the current year about 23,000 new insects were added to the collection. Prof. Dan Gerling hosted Dr. G. Evans a USDA APHIS BARC specialist on the taxonomy of Alyerodidae and Tetranychid mites. Dr. Evans was in Israel for 3 weeks and also taught a short

course for the Israel Taxonomy Initiative. He Helped identify material in the TAU collection of Aleyrodidae. Among others he identified the new invader to Israel *Singhiella simplex*. Prof. Gerling also hosted Dr. J. Heraty from the University of California Riverside, specialist on Chalcidoidea. Dr. Heraty collected and identified material of our collection, especially Eucharitidae, and taught a short course on Chalcidoidea for the Israel Taxonomy Initiative. We identified and added to our collection ~ 100 species of Aleyrodidae, especially from Africa and some of their parasitoids. Vladimir Chikatunov performed a huge study of identification on a beetle collections from pitfall traps and malaise traps from various projects and areas (southern Arava and southern Jordan, Mt. Carmel, Nizzanim, Adullam, Avedat and Lehavim, the coastal plain, Nahal Shaharut, the Jordan Valley and others). There is a close working relationship between the "Plant Protection and Inspection Services" (PPIS, Ministry of Agriculture) and the insect and arthropod staff. As in previous years, the collection staff made identifications work and advised the PPIS members.

We continue the fruitful cooperation with Tel Aviv University students collecting samples in the field. Collections made by students are immediately digitized in order to facilitate easy transfer of specimens to the museum in the near future. Cooperation between students and staff of the collections is excellent. We give the students support in all fields including preservation, identification, labeling, and cataloguing. Tirza Stern has developed a unique database for this purpose and continues to work with the students, adjusting it to their special needs. Students of Tamar Dayan have transferred a very large collection to the museum, containing thousands of specimens, of mammals, amphibians, reptiles, and arthropods caught in pitfall traps. Together with the samples, the collection managers are provided with the digitized database to assist their incorporation into the National Collections and to help avoid mistakes. The vertebrates among them have been preserved, identified, digitized, and labeled; the invertebrates were preserved and sorted for future identification. An additional collaboration is being conducted with the

laboratory of Yael Mandelik from the Faculty of Agricultural, Food and Environmental Quality Sciences of the Hebrew University, a collaborative project with Tamar Dayan. The research engages with biodiversity and ecosystem services in the arid agro-natural landscape of the Arava Rift Valley. It focuses on the pollinator guilds, specifically bees, and the pollination services they provide to crops and wild plants. Wild and managed bees (*Bombus* and honey bees) are collected, using netting and pan traps (plates filled with soapy water). The museum staff advises this research, instructing on how to identify the insects and how to conduct a collection. All the Hymenoptera specimens in this research are properly labeled and have a museum catalog number. At the end of this study the items will be incorporated into our collections. Students of Menachem Goren, also collected fish from the Mediterranean and freshwater rivers, and transferred their samplings together with the collecting data to the museum.

Annual report, tetrapod collection

Shai Meiri, Roi Dor, Tamar Dayan, Arieh Landsman, Erez Maza, Igor Gavrilov, Daniel Berkowic , Stanislav Volynchik, Kessem Kazes, Amir Glick

Personnel

The tetrapod collection curatorial staff is set to receive Dr. Roi Dor as Curator of Birds. This is likely to only officially take place in October 2013, but Roi is now a museum postdoc, and he is already starting to get involved in curatorial matters. Roi is an extremely qualified evolutionary biologist and ornithologist, and we are sure he will make a most valuable addition to the curatorial staff.

Dr. Stas Volynchik, who until now was working part time in the collection (and doing collections-based research for the rest of the time), has started working full time as a taxidermist. Igor, our senior taxidermist, has prepared a detailed training plan for Stas, who will undertake to learn more taxidermy skills in the

years to come. With the increasing influx of material into the collections (see below), the preparation looks like it is becoming a bottleneck of collection development enlargement. We therefore recruited an undergraduate student, Amir Glick, to work for a day a week as assistant taxidermist. Daniel Berkowic, the collection manager, has also started spending one day a week doing taxidermy work. Kessem has doubled her time at the collection to two days per week, and will spend the extra day helping Daniel in the dry collection. Erez and Arieh continue their brilliant work mainly (but by no means only) in the alcohol specimen collection.

Collection growth & active collecting

Between September 6th, 2011 and July 25th, 2012 our amphibian collection has grown by 35 specimens to 2415. Most specimens are salamanders (*salamandra inframaculata* collected by the Nature Protection Authority (NPA, 35 specimens with death dates in 2011 and 2012). These figures do not include three specimens of the recently re-discovered Hula painted frog, *Discoglossus nigriventer*, which are being studied by Sarig Gafni and Eli Geffen. These dead specimens were promised to the collection by these researchers and received collection numbers already (2572, 2573, and 2574). Over the same period the bird collection has grown by 408 specimens to 17,031. This figure does not include many birds (>100) that were brought to the collection, and now await preparation. Most birds are brought in from the wild animal hospital of the Nature Protection Authority (NPA). The most common bird species of 2011-2012 (death date) are the great tit (*Parus major*, 8 specimens) and the white stork (*Ciconia ciconia*, 7 specimens). The mammal collection has seen the largest growth, with 723 new specimens catalogued since September 2011 – to an impressive 13433 specimens altogether. Most of these mammals were collected by NPA rangers, or brought from the wildlife hospital. Some small mammals were brought by students surveying terrestrial arthropods. Due to the preservation liquid used in the arthropod traps, however (a mixture containing acid) the value of the latter specimens for osteological or genetic work is

dubious, at best. Some recently received mammals are large – we have recently received a few onagers, addax, and camels. The most common mammals we receive (those that died in 2011 and 2012) are still golden jackals (*Canis aureus*), gray wolves (*C. lupus*), and mountain gazelles (*Gazella gazelle*). So far in 2012 the most common mammals are the least shrew (*Suncus etruscus*, 8 specimens, all in acid) and the striped hyena (*Hyaena hyaena*, six specimens from 2012). The reptile collection has seen active collecting for the first time in decades, with Shai Meiri obtaining an Israel Taxonomic Initiative (ITI) grant to survey reptiles, specifically for the museum. After much debate with the NPA limited collecting permits were obtained. Other permits were granted for collection of tissue samples (tail tips) for genetic studies, and some sampling was approved for the study by ITI PhD student Karin Tamar. Altogether the reptile collection has grown to 15957 specimens, an increase of 424 specimens over the last year. Most of the new (2012) specimens are small lacertid lizards (especially *Acanthdactylus* spp., *Phoenicolacerta laevis* and *Ophisops elegans*), house and fan-footed geckos (*Hemidactylus turcicus* and *Ptyodactylus guttatus*) and the Bridled Mabuya (*Trachylepis vittata* – all the above-mentioned species with 15-20 specimens) We continue to enjoy from highly fruitful collaboration with two reptile enthusiasts, Aviad Bar (see publications using the collection below) and Ofer Shimoni, who collect dead reptiles they find (mostly in dry water holes in the Negev, and on the roads of Mt. Gilboa) and pass them to us. The NPA contributes some reptiles (some of which they meant to keep alive, but were too inapt to do so, e.g., the last *Micrelaps* in the collection), but it should be noted that the NPA has recently lost the only two rangers that were keen herpetologists (Roi Talbi and Gal Vine). Both used to contribute reptiles to the collections of the Hebrew University. The NPA maintains its dedication to the Hebrew University herpetology collection – commissioning Boaz Shacham to all survey work. Thus the small numbers of reptile specimens they contribute to TAU relative to the situation in other tetrapod classes is explained.

Connection with other organizations

We are maintaining and expanding the connections between the bird collection and both the air force and the civilian aviation authority. A full report on this activity will be presented by the responsible person.

We keep maintaining special, good although sometimes strained ties with the NPA. As mentioned above we receive many, perhaps most of our specimens from the NPA, and NPA rangers often go out of their way to collect dead animals for us, and make sure we get them. We have tentatively established connections with the JNF, KKL- whose foresters we hope to collect specimens for us. We have held a workshop for them to begin this cooperation.

We have made initial contact with the birding and ringing centres with the aim of obtaining birds that dies during the ringing process from the ringers.

Equipment, infrastructure, storage and curation

We are trying to have all Israeli tetrapods represented at the collection by at least two (male and female) complete skeletons. For some of the unique and more sought after (academically) Israeli animals we are trying to establish a large comparative post-cranial collection (e.g., gazelles, hyenas, fallow deer, wolves). We have also started collecting tissue specimens of vertebrates from which no other parts (e.g., skulls) are kept. We only keep such tissues where the animal was positively identified by a museum employee. We take tissue samples from nearly all tetrapod specimens (with the exception of rotting or tiny animals).

We try to move as many specimens as possible into dedicated collection cabinets. Almost all specimens coming in today are moved to such cabinets, but existing specimens kept in worse conditions are not – because cabinets are costly. We are looking into starting to place specimens in transparent plastic boxes (made by Durphy; http://durphypkg.com/boxes.html). We aim to purchase a trial batch the coming year. These boxes, used in the British

Columbia Museum, keep specimens safer, and when accessing a drawer allow a researcher to pick only the necessary specimens rather than move a whole bunch – thus minimizing damage. We also started purchasing large (10L) plastic containers for alcohol-preserved specimens.

Igor and Stas improved the infrastructure of the preparation area. Sanitation remains a problem and should be improved.

Generally, we are running out of space in which to store specimens. We hope the new collections building will be ready before this becomes a major obstacle, and that collection space there will be big enough for present and future needs. Conditions in the wet collections are abysmal as far as fire danger, exposure to humidity, temperature, asbestos and organic solvents, and to fungal, rodent and insect hazards are concerned. This is not only a danger to the collection, but also to the collection staff as some of the materials are carcinogenic.

On the plus side, we recently installed new air conditioners in the dry collections, helping to keep temperature and humidity lower and more stable, enhancing preservation.

The tissue collection has no emergency electricity and no uninterruptible power supply, which remains a problem.

The (bird) egg collection was enhanced by the inclusion of father Schmitz's collection. The eggs were in a bad state, but restored with the dedicated work of Daniel. Daniel has started computerizing the egg collection – and is about half way finished. He will finish digitizing it within a year. The nest collection is still not computerized and its fate needs to be decided.

Macroevolutionary Aspects of Morphological Integration

Annat Haber

Differences between groups in their diversification rates and patterns result from a combination of extrinsic factors - such as environmental and geographic elements - and intrinsic features of the organisms. The study of morphological integration focuses on the intrinsic factors as reflected by the covariation between morphological characters during development. Thus, the study of morphological integration can complement ecological and behavioral studies in understanding diversification patterns. Many studies have examined the connection between morphological integration and selective forces within species, and thus the microevolutionary effects of integration. Far fewer studies have considered integration across higher phylogenetic scales that enable them to evaluate the long-term macroevolutionary implications of integration.

The goal of this project is to utilize a dataset of morphological characters that I have recorded for ruminant species in order to further test and explore the macroevolutionary theory of integration as well as the association between integration and other species-level characteristics. An essential step towards this goal is to enhance our understanding of the statistical properties of the various techniques that have been developed for the study of integration, and improve them as necessary.

In the past year I have focused on the methodological aspects of the study of integration. I elaborated on a simulation study that I have started to develop previously. This study compares the sampling distributions and statistical power of several integration indices, including the effect of the number of characters, matrix shrinking, and parametric vs. nonparametric approaches. I improved the program codes that I have written for carrying out the bootstrap and permutation procedures that are commonly used in the study of integration. These procedures can now be carried out substantially faster and are more user friendly, potentially enhancing comparability of studies and collaboration. This

study, along with the R script for carrying out the analyses, has been published in September 2011 in *Evolutionary Biology*.

I also explored and tested the effect of accounting for body size using different methods. The effect of body size is an on-going debate in the study of integration. Yet, the implications of the different methods for estimating body size and accounting for it have not been fully explored before. I found that different methods yield different results, and that better understanding of both the biological and the statistical meaning of each method is needed. I incorporated some of these findings in my upcoming paper on the macroevolutionary implications of integration in the ruminant skull.

In addition to my scientific activity, I have developed an educational program on the topic of evolution for high school students through "Campus Teva" – the science education unit of the Zoological Gardens at Tel Aviv University. This program includes 4 hours of lecture, hands-on activities and a tour of the Zoological Gardens, designed to enhance student's understanding of evolutionary principles and natural history. The program has already been successfully implemented.

In the coming year I intend to augment my dataset of ruminant morphology by digitizing the complete skull collection of *Gazella gazella* and *Gazella dorcas* curated in the museum. This will provide large enough samples to be able to test the effect of sexual dimorphism on integration patterns, as well as a better empirical basis for methodological studies. It will also open the door for future studies that look into the ecomorphology and natural history of these local gazelle species.

In addition, I intend to further explore the evolution of integration patterns across the ruminant tree by using recently developed phylogenetic comparative methods. These methods allow fitting evolutionary models to multivariate spaces as opposed to testing one dimension at a time, thus increasing power and accuracy. Finally, I will look into the association of integration and other

species-level characteristics, including species richness, ecological diversity and geographic range.

Arachnid Collection September 2012

Efrat Gavish-Regev

1. Scientific Background and Information on the Collection

The order Araneae (Phylum: Arthropoda; Class: Arachnida) is ranked seventh in global diversity, after the five largest insect orders and the arachnid order Acari. Currently, there are 43,244 spider species described in 3,879 genera and 111 families (Platnick, 2012). Almost half of the known spider families were recorded from Israel thus far (at least 50 families out of 111 known spider families), and thirteen have been extensively studied by the late Gershom Levy (1937-2009). Yet, there is still a scarcity of knowledge on the taxonomy, biology, and ecology of many of the spider families occur in Israel and its surroundings.

The Arachnid collection at Tel-Aviv University contains mainly spiders, but also other arachnids such as Solifugae, Scorpion, Opiliones and Pseudoscorpion material, collected during ecological and biodiversity studies from various regions of Israel, mainly by Dr. Yael Mandelik and Arie Landsman, Dr. Merav Vonshak, Udi Columbus and Tal Levanony, Ina Steinberg, Orit Skutelsky, Iris Bernstein, Itai Renan, Dr. Sergei Zonstein, and Dr. Efrat Gavish-Regev. As well as material collected occasionally by professionals (i.e., Dr. Danny Simon, Prof. Zvi Sever, Dr. Uri Shanas), by professional amateurs (i.e., Mr. Amir Wienstein, Mr. Ron Keren) and by the public.

2. Ongoing scientific projects related to the collections

2.1.) Biogeography and taxonomy of sheet-web spiders (Linyphiidae: Araneae) in Israel.

Sheet-web spiders (Linyphiidae) are the second largest family of spiders, with 4,412 species (>10% of all known spider species) in 587 genera. Linyphiids have a worldwide distribution, but are most diverse in the northern temperate regions; less than 10% of the described linyphiids are known from North Africa and the Middle East. Nonetheless, several species recorded as occurring solely in semi-arid or arid regions, and the paucity of described species from this region may also be due to the scant research on linyphiids in North Africa and the Middle East. For instance, although only seven linyphiid species are currently reported from Israel, two field studies of spider diversity in arid agroecosystems in the northern Negev desert and a collection based study (in progress), yielded thus far 33 linyphiid species, only four reported from Israel before. Out of the 29 species that were not yet reported, seven are presumed new species to science (Gavish-Regev et al., in prep.), and the rest are reported from Israel for the first time. It is likely, therefore, that much of the linyphiid fauna of Israel and its surroundings remains undiscovered.

This research project aims to describe and document the linyphiid fauna of Israel, and their geographic distribution ranges, mainly from the Arachnid Collection of the National Collections of Natural History at Tel Aviv University; the Arachnid Collection of The Hebrew University of Jerusalem; and the research collections of the Ecology Department at Ben-Gurion University of the Negev.

<u>As part of this project one paper was published in 2012 in the Arachnological Bulletin of the Middle East and North Africa:</u>

- Robert Bosmans and Efrat Gavish-Regev. 2012. A new synonymy in a linyphiid spider from Egypt (Araneae: Linyphiidae). *Serket* 13(1-2): 99-103.

<u>2.2.) Systematics of the genus Sintula Simon, 1884 (Linyphiidae: Araneae): morphology based revision, phylogeny and monophyly.</u>

Sintula Simon, 1884, consists of 17 described species, 12 of which are found in Europe, four in North Africa and one in both North Africa and Europe. It is one of few linyphiid genera that were found both in the crop fields and in the

natural arid habitats in intensive surveys at the northern Negev desert agroecosystems. This research project aims to to revise taxonomically the genus *Sintula Simon*, 1884. As part of the revision, I will determine which species of the genus Sintula Simon, 1884, are found in Israel, describe new species of Sintula from Israel, and create a key for Sintula species found in Israel. In addition, I will test the hypothesis of monophyly of the genus *Sintula Simon*, 1884 and determine Sintula phylogenetic placement and its species level phylogeny.

This proposed taxonomic revision of *Sintula* will add to the knowledge of linyphiids from arid regions, and to the knowledge of the linyphiid fauna of Israel and its surroundings. State of the art taxonomic descriptions with extensive morphological documentation are not available for many species in the Linyphiidae, especially for species inhabiting semi-arid and arid environments.

3. Equipment

There is one high-quality stereomicroscope with a Camera Lucida and a Canon Camera (Discovery V20, Zeiss; purchased by the National Collections of Natural History at Tel Aviv University at the end of 2008) that serves the collection, as well as other collections.

The morphology of Messor ants from Israel and the surrounding countries

Inon Scharf

I have been a postdoctoral researcher in the Insects Collection during the last three months (July-September 2012). Dr. Armin Hirsch-Ionescu and I have studied together the morphology of Messor ants from Israel and the surrounding countries. The Insects Collection at Tel Aviv University has a large number of specimens belonging to this genus, enabling a comparative analysis of Messor species. Messor species occur in diverse habitats, from desert sandy habitats to Mediterranean rocky ones. The goal was to identify morphological differences

across species and to relate them to the habitat of origin. We were particularly interested in the ratio between leg and mesosoma length, as it has been speculated that ant workers from warmer habitats would show a higher leg-to-body length ratio. This pattern have been shown in other two ant genera (Cataglyphis and Ocymyrmex; Sommer and Wehner 2012).

We selected 10 species representing different subgeneric groups, and measured six body traits: Head width, head length, antenna length, eye length, mesosoma length, and hind tibia length. We later added several additional qualitative traits, such as color, brightness and the general shape of the head. We found that in accord with our expectation, species occurring in sandy habitat had to some extent larger legs relative to their body. However, the results are not easy to interpret, because the existing subgeneric division of Messor is partial, problematic and different sources sometimes even contradict each other. This is problematic because species should be compared to their closest relatives, within each subgenus. Therefore, we have recently started to further examine the subgeneric division of the studied Messor species. After reaching a better understanding of this division, we will compare again groups of 2-3 related species. We believe that our study can provide a fine example for convergent and divergent evolution, and I intend to continue it after the end of my postdoctoral training in the Natural History Collections.

Avian biodiversity and the evolution of traits, mainly in bird species

Roi Dor

Collections-based research outline

My main research interests concerns avian biodiversity and the evolution of traits, mainly in bird species. In order to understand biological diversification and the relative contributions of different factors such as ecological adaption and sexual selection to speciation processes, I reconstruct the phylogenetic

relationships between species using molecular tools and apply comparative analysis approaches. I intend to continue and examine phylogenetic relationships, diversification and trait evolution in avian groups. For example, Passeridae and Fringillidae are two closely related avian families which are similar in some ecological aspects yet exhibit variation in morphological, life history and behavioral traits. This makes them ideal to examine the relative contribution of the various traits to their biodiversity, and compare it between the two families. These families are also well represented in Israel, thus there are many vouchered specimens available at the National Museum of Natural History at Tel Aviv University, including more than 850 Fringillidae and more than 650 Passeridae museum skins. These specimens will enable measuring morphological traits such as measurements of body size and coloration, as well as estimating sexual dimorphism. In addition, toe-pads samples may be used to generate DNA sequences for phylogenetic reconstructions as needed.

Curatorial goals outline

As a prospective curator of the avian collection at the National Museum of Natural History I have already started studying the collection at Tel Aviv University and developing plans to enhance both its scientific and public attributes. Maintaining the existing collection will be improved through better preservation and keeping practices, improving existing protocols and the collection database. Collection database will include all items in the collection and will be available online to the worldwide scientific community. I will work to organize the birds' eggs collection and make it available for the collection's database as well. In addition, I will work to expand the collection through better collaboration with Israel Nature and Parks Authority, bird ringers from the Israeli ornithological community and the general public, and insure the best possible use of every sample brought to the museum. The connection with the general public and museum outreach activities will be achieved through collaborations with education bodies aimed at students from all levels (such as

Campus Teva at Tel Aviv University), nature guides and for those interested in nature conservation (for example from SPNI).

Research activities 2010/11

Daniella E. Bar-Yosef Mayer

The past academic year was dedicated to several activities that relied on research in the malacological collections, based at the Natural History Collections, Tel Aviv University. Those include the study of archaeo-malacological shell assemblages of sites in Israel and in Turkey, as well as consultations to a number of archaeologists regarding shells from archaeological sites in Israel.

My research at the Neolithic site of Çatalhöyük, Turkey, continued with the investigation of freshwater bivalve *Unio mancus eucirrus* as a source for isotopic information related to palaeoclimatic reconstruction. Together with Dr. Melanie Leng of the NERC Isotope Geosciences Laboratory of the British Geological Survey, we are preparing for publication the results of isotopic analysis in order to enhance the understanding of environmental conditions at the site during its occupation, obtained from the freshwater gastropods as well as other fauna, flora, and geological data. This is of particular importance regarding the last phases of the site's occupation, which according to some interpretations, is related to the climatic event of 8.2ka BP.

Furthermore, the shells of the TP excavation area at the site was prepared for publication.

The analysis of shells from the Late Bronze and Iron Age sites of Tel Rehov (directed by Prof. Amihai Mazar) is at an advanced stage of analysis and is being prepared for publication. Other shell assemblages studied this year include the Palaeolithic site of Mislya, dated to ca. 200,000 years ago, where a

large variety of environments were exploited by this early human population, as evidenced by the shells taxa. Molluscs at the Chalcolithic site of Palmahim also suggest that various resources were brought to the site from the estuary of Nahal Soreq.

Consultations to a number of archaeologists regarding their shell assemblages included: The Roman/Byzantine site of Bat Galim, studied by Lisa Yehuda; the site of Herodion, studied by Roi Porat; and the Neolithic site of Qumran studied by Hili Habas, a graduate student at TAU's department of archaeology.

Report on the activities in the collection of parasitic wasps (Hymenoptera: Ichneumonoidea) of the National Collection of Insects, TAU

Wolf Kuslitzky

1. Ichneumonidae and Braconidae have been collected, mounted on pins and labeled (ca. 1,500 specimens). Other Parasitica superfamilies (Bethyloidea, Chalcidoidea, Proctotrupoidea, Ceraphronoidea and Cynipoidea have been collected and preserved in alcohol or mounted (ca. 1,000 specimens). During the reporting period, the parasitic Hymenoptera were collected with the Malaise trap (Ein Ovdat reserve and Mishmar Dawid), with a net in various places and were reared from different hosts on *Centaurea* spp. (Asteracea). In addition there were contributions from A. Freidberg, L. Friedman and other collectors.
2. The newly collected material of Ichneumonidae was sorted to subfamilies.
3. The materials of subfamilies Anomaloninae (from H. Schnee, Germany) and Metopiinae (from Dr. V. Tolkanitz, Ukraine) after verification came back to Israel. At present the rest specimens from mentioned subfamilies are sorting and are arranging in the collection.
4. The subfamily Banchinae (125 species) were arranged in the collection and a list of species was prepared.

5. Ca. 20 species of various insect were identified for the Plant Protection and Inspection Services, Ministry of Agriculture and for various scientists in Israel.

In September 2011 I worked with collection of Ichneumonidae in the Museum of Zoological Institute, St. Petersburg, Russia and Zoological Museum of Moscow University, Moscow, Russia.

Interim report on the partial revision of the Myrmicinae genera *Aphaenogaster*, *Cardiocondyla* and *Crematogaster* from Israel and curation activity in TAUI.

Armin Ionescu

In the submitted work plan for the period October 2011 – September 2012 I planned the review of the Myrmicinae genera *Aphaenogaster*, *Cardiocondyla* and *Crematogaster*, i.e. to provide a list of the revised species; descriptions of species that are new for Israel; a key for the revised species.

To date all the specimens in TAUI belonging to the 3 genera were examined and reidentified according to the latest taxonomic publications, and illustrated keys are available for users. The publication of the new cavernicole *Aphaenogaster* specie is in work in collaboration with Prof. A. Tinaut (Universidad de Granada) and Dr. C. Drees (Humbold University), as part of a revision of *Aphaenogaster* based on molecular data.

During this period I identified and integrated into the TAUI collections material collected during an ITI survey conducted by Dr. J.-J. I. Martinez in The Bar'am forest. In addition, I identified and integrated into our collections ants from two other pitfall-trap projects conducted by Dr. J.-J. I. Martinez in the Upper Galilee and the lower Golan (about 3000 specimens in 500 vials). Part of the results

was presented at the 2011 Conference of The Zoological Society of Israel and at the 5th Congress (European Sections) of the I.U.S.S.I.

I assisted Prof. A. Hefetz and Dr. S. Aaron (Universite Libre de Bruxelles) in a study concerning *Cataglyphis* species from Israel. I identified *Cataglyphis* specimens belonging to the *bicolor* species group that were collected by R. Seltser (M.Sc. student) in a country-wide survey. About 250 of these specimens were included into a morphometric study based on 18 characters aimed to clarify the relationships within the species group. However, after a molecular-taxonomy investigation, it seems that I have to revise the species belonging to the genus *Cataglyphis* from Israel, and to rework the present ID-keys. Part of the results from this collaboration was presented at the 5th Congress (European Sections) of the I.U.S.S.I. (classifying by morphological and chemical characters), and at the 31-th (2012) Congress of the Entomological Society of Israel (comparison of morphological and DNA based classifications).

Moshe Guershon and I submitted a paper containing a species list and key of *Xylocopa* bees from Israel to the Israel Journal of Entomology.

The amount of harvester ant specimens examined for the mentioned surveys motivated me to begin a morphometric examination of these ants (about 85 terminal taxa and 56 characters) in order to achieve a better understanding of the relationships among species groups.

Routinely I identify imported ants that were intercepted by the customs authority. I will mention that during the last year were intercepted and destroyed to shipments infested with large fire-ants.

Managerial work in the Bee Collection: Annual report and working plan.

Dr. Moshe Guershon, October 2012

Managerial work focused on: technical arrangement, maintenance and scientific work, including macro-taxonomy of specific groups in the collection.

Taxonomy, Species list and identification keys:

The list of the Israel bee fauna as well as the preliminary identification key and the interactive illustrated identification key for all Israeli reported genera (76) are continuously being updated.

The article on the *Xylocopa* of Israel was finished and submitted.

An annotated list of species of the two related genera *Ancyla* and *Tarsalia* is being created, including an identification key with illustrations.

Approximately 2500 unsorted specimens were determined to genus level. All Meliponini and Panurguini that were sorted by me but remained unidentified were revised by Dr, John Ascher during his visit (see below) and determined to correct species (or genera) level. Some other sorted material (aprox 400 specimens) was sent for further identification to species level to Drs. Christophe Praz (Switzerland expert on Megachilidae) and Terry Griswold (USA expert on Anthidiini). The material sent to Dr. Praz was already received back and, together with the material determined by Dr. Ascher, have been re-organized in the collection.

I made identification, to genera or species level when possible, of bees collected by participants of the Entomology Course at TAU and to some specimens from Dr. Yael Mandelik's (Faculty of Agricultural Sciences, The Hebrew University) surveys.

Digitalization of collection data:

Labels data of all *Ancyla and Tarsalia* specimens in the collection were digitalized.

Fauna surveys and collecting trips:

A survey of the bee fauna in the botanical garden was performed in cooperation with Dr. John Ascher from the AMNH. Additionally, 3 collecting trips were performed to different sites at the Sharon and Modiin areas.

For all surveys, the work included collection of wild bees, followed by their arrangement and determination to genus level in the lab.

Visiting scientists: Dr. John Ascher from the American Museum of Natural History was the guest of the collection (invited by the Israeli Taxonomy Iniative (ITI)). He worked on the identification of numerous exotic genera and species from tropical Africa and Asia, and from the Americas.

Specialization courses: I hosted Dr. John Ascher for the delivery of a course on taxonomy of Bees of Israel. I assisted the course both as a local expert and as an attendee.

Next year working plan:

To continue sorting unidentified specimens to the genus level, sending material to experts worldwide and digitalization of labels' data into the database (selected groups).

To prepare and submit an article on the *Ancyla* and *Tarsalia* of Israel.

To promote contact with additional experts in the world that will accept material for determination.

Porifera and Bryozoa collections – Annual Report – 2011/12

Sigal Shefer

The objectives for the current year were:

1. Collection and field survey of the Porifera and Bryozoa community along the Mediterranean and Red sea coasts of Israel.
2. Identification of newly collected sponges and bryozoa samples as well as samples present in the Collections of Natural History at Tel Aviv University.
3. Generating database of the Porifera and Bryozoa collections, physical organization, scientific documentation and taxonomic updating.

Efforts have been made to make a progress in all the above categories.

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

Bryozoa: Samples were collected along the Mediterranean coast of Israel at depth of 4-30 m, in Akhziv, Rosh-Haniqra, Haifa Bay, Newe Yam, Hadera coal pier, Sedot Yam, Herzliya, Tel Aviv, and Ashkelon. 75 specimens were added to the collection.

Porifera: This year samples were collected during seven excursions to the following sites (north to south): Haifa Bay, Haifa-Rosh Carmel, Maagan Michael, Hadera pier, Sdot Yam, Palmachim and Ashqelon.

This was supported by the Israel Taxonomy Initiative (ITI) as part of a surveys entitled: "Understanding the Israeli Mediterranean demosponges diversity with a focus on the order Dictyoceratida", by Sigal Shefer, Tamar Feldstein, Ruthy Yahel, Dorothée Huchon and Micha Ilan.

2. Identification of newly collected Porifera and Bryozoa samples:

Bryozoa: Mrs. Noga Sokolover with the help of Dr. Paul Taylor (Natural History Museum of London) and Dr. Mikel Zabala (University of Barcelona) identified 38 Bryozoa species of which 22 are first record in Israel.

Porifera: Sponge samples collected during the latest excursions are processed for morphological identification by histological analysis of skeleton structure, composition, and organization (spicules and fibers). We have deposited 158

samples to the National Collections during the last year. Based on morphological characteristics and 18SrDNA sequences, we were able to divide them into 36 different species representing 12 different orders.

3. Physical organization, and scientific documentation of the Porifera and Bryozoa samples present in the Natural History Collections

Bryozoa: All samples present at the Bryozoa collections of Tel Aviv University are now available on a computer file.

Porifera: The sponge collection is going through an archiving process. This process included updating scientific names, printing new labels and replacing fixative solutions. In addition, the large collection of Prof. Micha Ilan is being transferred these days the the Porifera collection located at the zoological garden.

Courses and Training:

Bryozoa: In the last year Noga participated in a taxonomic training course (15th to 19th August 2011) taught by Professor John Ryland, a leading expert in bryozoan taxonomy.

Porifera: In April 2012 I participated in a workshop on Atlanto-Mediterranean deep-sea sponge fauna, that took place at the University of the Azores, Ponta Delgada, Portugal. This was enabled thanks to the support of the National Museum of Natural History at Tel-Aviv University. During the workshop I met some of the leading sponge taxonomists and created the basis for future collaborations. This training improved my ability to identify sponges.

Museum Sample loans:

One sponge specimen (TAU25197) was sent to Dr John N.A. Hooper from Queensland Museum & Sciencentre, Australia.

Museum samples were used by members of Dr. Dorothee Huchon's lab (TAU department of zoology), and some sponge samples were received to the collection from her lab originating from Thailand, Iceland and Lebanon.

Taxonomic identification service:
I received sponge samples for identification from the Israel Oceanographic and Limnological Research (IOLR).

Molecular collections - Annual Report – 2011/12

Tamar Feldstein

Activity objectives for 2011-2012:

1. Collection and molecular identification of the Israeli sponge fauna, as part of the Israel Taxonomy Initiative (an ongoing project).
2. Assisting researches from overseas requesting for tissue samples from the collection.
3. Initiating a long term experiment to improve the protocol for the preservation of fish specimens in the collection.

1. Collection and molecular identification of the Israeli sponge fauna.
I participated in a survey of the Israeli sponge fauna together with Dr. Sigal Shefer, Dr. Ruthy Yahel, Dr. Dorothee Huchon and Prof. Micha Ilan in a research supported by a grant from the Israeli Taxonomy Initiative (ITI). During this survey, more than 130 new sponge samples were deposited in the collections. I extracted DNA from about a third of these sampled and performed molecular analysis of the 18S rDNA. Specimens belonging to the Dictyoceratida order were also analyzed for three additional markers (COI, 28S and ALG-11). Preliminary results were presented in a poster during a seminar on Taxonomy and Biodiversity held at the Tel Aviv University.

A new research proposal to pursue this study was submitted and accepted by the ITI.

2. Researches from overseas supported by the tissue collection
Three research projects received tissue samples from the collections:

a) Hannes Lerp at the laboratory of Dr. Martin Plath from the Department of Ecology and Evolution at the University of Frankfurt/Main received 20 tissue samples of *Gazella gazelle* to perform phylogeographic and population genetic analyses.
b) María Vergara from the University of the Basque Country, Spain, received seven tissue samples of *Martes foina* for a study on phylogeography and genetic structure.
c) Alejandro Centeno-Cuadros, a visiting post-doc at the Hebrew University, Jerusalem, received 25 tissue samples of *Rousettus aegyptiacus* for a reseach on dispersal and colonization success of the Egyptian fruit bat.

3. Examining the preservation procedures for the fish collection
An experiment was set up in the collection room, in order to improve the protocol of fish preservation for future use in molecular researches.

Scleractinia Taxonomic survey - Annual Report 2011-2012

Gal Eyal and Yossi Loya

Tropical coral reefs are the largest and most spectacular biological structures made by living organisms. The order Scleractinia (Cnidaria: Anthozoa), constitutes ca. 1,300 species, is mostly described from shallow-water reefs (i.e. <30m). Recent studies have demonstrated that coral reefs below recreational SCUBA diving depth (>30 m), commonly referred to as Mesophotic Coral Ecosystems (MCEs), host a thriving community of plants and animals that has remained almost completely unexplored. The last and only taxonomic study of deep scleractinian corals in the Gulf of Aqaba/Eilat was carried out by Fricke (1983-1986) using a submersible. Many of the corals in that research were only

photographed and have no skeletal record, making their taxonomic identification questionable.

The objectives of this research were (a) to compile a list of mesophotic coral species including potential first records to the area and possibly new species (b) to establish the first mesophotic coral collection and (c) to establish for the first time a genetic tissue bank of mesophotic corals. The research included six mesophotic sites along the Gulf of Aqaba/Eilat. Twenty two coral species belonging to 10 families were collected in Eilat.

This work reveals for the first time the ecological parameters of the mesophotic benthic community of Eilat coral reefs. One site with two depths was chosen (40 & 60m) for a photographic ecological survey. The survey estimates the living cover, biodiversity, evenness and abundances of the main groups of biota and compares it to the shallow reef community. The mesophotic area exhibited ca. 33% of coral cover compared to ca. 24% in the shallow reef; Shannon's index of diversity of 2.33 compared to 1.0 in the shallow reef and high evenness of 0.53 compared to 0.37. Altogether, these parameters indicate a healthy and flourishing coral reef in the mesophotic area.

As shallow reefs are suffering more and more from anthropogenic pressures resulting in loss of local biodiversity, research has begun to search for ways of mitigating these losses. One important venue is the study of deep or mesophotic reefs at the limits and beyond recreational diving, in order to ascertain if these reefs provide refugia or source for coral species. This research emphasizes the biological and ecological importance of mesophotic marine communities in Israel and provides for the first time taxonomic assessment of possible new records and new coral species.

Progress Report for the Paleontological Collection 2011-2012
Olga Orlov-Labkovsky and Henk K. Mienis

During the past academic year Olga Orlov-Labkovsky continued to work on:

1. The preparation of the fossil material present in the Paleontological collection, the organization of a Database for fossils; the description of taxa and the detailed documentation of taxonomic lineages.

She continues to work with the collections of foraminifera (thin-sections or slides) of the Carboniferous system (Upper Paleozoic) in the Middle Tien-Shan (Central Asia, Uzbekistan and Kazakhstan).

Olga prepares the collection slides of the Fusulinida (originals, type-species and holotypes) published by Bensh F.R. “Stratigraphy and Fusulinida of the Upper Paleozoic of the South Fergana”.

2. The Taxonomy and Biodiversity of the Upper Permian Foraminifera of Israel

During the past academic year Olga Orlov-Labkovsky continued to work on the project "Foraminifers and Algae of Permian and Triassic age from borehole David 1, Israel; Permo – Triassic (P/T) transition at the Coastal Plane in Israel ". While Olga is taking care of the Permian Foraminifera, Dr. D. Korngreen of the Geological Survey of Israel in Jerusalem is studying the Triassic Foraminifera. “The Permo – Triassic transition in the Central Coastal Plain of Israel (North Arabian plate margin) - David 1 borehole” paper has been prepared and accepted for publication in the journal 'PALAIOS'.

3. The stratigraphy and taxonomy of Carboniferous foraminifers of Uzbekistan

Currently Olga isintensively working on the Carboniferous foraminifers of Uzbekistan.

As part of his work in the Mollusc collection Henk Mienis is working on Late Pleistocene and Holocene molluscs.

1. A former aquatic mollusc fauna in Nahal Lakhish near Ashdod: A study of freshwater molluscs from two layers in Nahal Lakhish, east of Ashdod,

revealed the presence of nine species of aquatic and amphibious molluscs. Among them was *Melanopsis buccinoidea* which means that once Nahal Lakhish was a perennial stream. A report is in print in the Archaeo+Malacology Group Newsletter.

2. Molluscs from a Roman-Byzantine water reservoir near Tel Goded were studied. A total of 17 species were recognized: 8 aquatic species and 9 terrestrial ones. The presence of *Islamia gaillardoti* and *Melanopsis buccinoidea* shows that during the Roman-Byzantine period plenty of running water was available the whole year round. This is in strong contrast of the situation today: not even a single spring is present in the area of the former reservoir. A report is in print in the Archaeo+Malacology Group Newsletter.

3. Late Pleistocene and Early Holocene Inland Molluscs from Cyprus: Recently a study was commenced of fossil material of inland molluscs collected by Dr. Reuven Ortal west of Akrotiri, Cyprus in January 1992. This study forms part of a project dealing with the recent land snails and inland aquatic molluscs of Cyprus carried out by Henk Mienis, Oz Rittner and George Konstantinou.

4. The mollusc species described by Nathan Shalem have been indexed (see elsewhere in this report). Now it is possible to check his collection, which forms now part of the Paleontological Collection, for the presence of type material.

New Acquisitions of the Paleontological Collection, 20011/12

The following new material has been donated to the Paleontological Collection:

Name	Brief description
N. Melzer	Ammonite from the Negev.
H.K. Mienis	Pleistocene (Eemian) molluscs from Terschelling, the Netherlands.
	Subfossil aquatic and amphibious molluscs from Nahal Lakhish.
	Subfossil inland molluscs from a Roman-Byzantine water reservoir near Tel Goded.
O. Orlov-Labkovsky	Foraminifera (slides) of the Visean-Serpukhovian transition (Carboniferous) from Paltau-XII section, Chatkal (Kocsu) Range, Uzbkistan.

	Foraminifera (slides) of the Visean-Serpukhovian transition (Carboniferous) from the Mashat VI section, south-western foothills of the Talass Alatau Range, Kazakhstan.
R. Ortal	Late Pleistocene-Early Holocene inland molluscs from Cyprus

Literature for the Paleontological Library
For the library we received a book dealing with the Pliocene and Pleistocene molluscs which are washing ashore in the Netherlands (donation H.K. Mienis).

F.P. Wesselingh & P.W. Moesdijk (Eds.), 2010. De Fossiele Schelpen van de Nederlandse Kust (The Fossil Shells of the Durch Coast). 332 pp. Nederlands Centrum voor Biodiversiteit Naturalis, Leiden.

From Youri Katz we received a copy of the book mentioned below containing the important article by Eppelbaum & Katz: Mineral Deposits in Israel: A Contemporary View (pages 1-41).

A.Ya'ari & E.D. Zahavi (Eds.), 2012. Israel Social, Econimic and Political Developments. 164 pp. Nova Science Publishers, Inc., New York.

Electronic Publications for the Paleontological Library
On a regular base we are receiving the DVD-ROM's in the series "Carnets de Géologie" or "Notebooks on Geology" which are mainly dealing with papers on fossil Brachiopods.

Progress report: Morphological variability in Vipera palaestinae.

Stanislav Volynchik

In the last academic year I have completed and published an article testing the geographic variability in the Palestine viper. The paper headed “Morphological Variability in *Vipera palaestinae* along an Environmental Gradient” analyzes the functional connection between ecological conditions and phenotypic variability, and assesses the degree of morphological distinction at the inter-population level. The following questions were asked: Does the V. palaestinae population in Israel show geographic morphological variation? Is there a relationship between external characters and latitude, elevation or ambient

temperature? What are the possible driving factors in regard to the appearance and development of phenotypic plasticity among these vipers? And, finally, how might environmental conditions or potential food resources influence the spatial variations in corporeal proportions and scalation pattern?

The effect of local habitat conditions on organisms, including environmentally-induced morphological changes, constitutes an important aspect of macroecology and evolution. The degree of geographic intraspecific variation in body dimensions, corporeal ratios and scalation pattern among male and female Palestine vipers in Israel were examined. Univariate and multivariate analyses using 20 variable features relating to metric and meristic characters were applied in order to determine the existence of geographic variability in this species.

Univariate analysis revealed that the majority of morphological characters possess relatively minor interregional distinctions, with only a few traits demonstrating significant differences. Discriminant analysis of mixed-gender samples using a combination of variables did not distinguish between geographic groups within each sex. The multifactor approach slightly differentiated between samples when sexes were compared separately, but with much overlap. The continuous sampling method revealed no statistically significant relationship between geographic and metric variables across the distribution range. A weak latitudinal cline was observed in snout-vent length, with both sexes being larger in the south. Noticeable temperature-correlated intraspecific variability was found in both body and tail scale counts but not in head scalation features.

Generally, *V. palaestinae* in Israel seem to be generally quite homogeneous morphologically, both males and females demonstrate the same phenotype-environment correlation. In natural habitats some external features of this species may also be influenced by the local environment, mainly ambient

temperature. Despite the mean values of almost all morphological characters not significantly differing across the distribution range, linear measurements and ratios of both males and females showed a certain latitudinal variability that may reflect diet-induced phenotypic plasticity. However, a lack of available data on geographic variation in morphological traits and in diet composition of this viper from other parts of its range precludes the testing of these hypotheses. Several scalation characters contribute to the separation of geographic groups by multivariate comparison. Moreover, the number of ventral, subcaudal scales and their ratio (ventr/Scd) within both sexes noticeably correlates with ambient temperature of the hottest month. The recorded temperature-induced scalation variability does not reflect a significant body length-ventral scales and tail length-subcaudal scales correlation.

The marked variances in scale counts would seem to reflect the temperature gradient across the geographic range of this species, which affects scale development during embryogenesis. The obtained results suggest that temperature conditions during early ontogenesis may induce quantitative changes in the scalation pattern of *V. palaestinae* and thus may indicate the potential evolutionary importance of environmental conditions.

Also this year I have focused on climate-related morphological variation in four lacertid species. At present I carry out a research on the relationship between abiotic environmental conditions and body size patterns among ecological heterogeneous oviparous lizards (*Phoenicolacerta laevis,* Ophisops elegans, Acanthodactylus boskianus and Mesalina guttulata) occurring the Mediterranean region. The possible influence of two basic climatic factors: average annual temperature (AAT) and average annual precipitation (AAP) on body, head and limbs dimensions was examined.

The preliminary results show that females, displaying a greater phenotypic variability along temperature and precipitation gradients, are more influenced

by environments than conspecific males. Nevertheless, the species are different in their responses to abiotic factors; specimens may simply be larger under cool and wet conditions, as well as to exhibit a wide range of allometric effects in various combinations. Among Mediterranean species (P. laevis, O. elegans) the morphology-environment link is stronger in respect of temperature conditions (AAT), whereas in desert dwellers (A. boskianus, M. guttulata) water-related variable (AAP) was the major determinant of spatial intraspecific variation.

My findings indicate that in these lizards the considered climatic components may significantly affect either absolute sizes or ratios, or both and thus, to play an important role in species ecology and evolutionary trajectories of populations.

Progress Report for the Mollusc Collection 2011-2012

Henk K. Mienis, Oz Rittner and Revital Ben-David-Zaslow

Research

During the academic year 2011/12 we continued to carry out research in the fields of taxonomy, systematics, nomenclature, Lessepsian migration and the presence of invasive species among the inland aquatic molluscs.

Fieldwork carried out on Mount Hermon (see elsewhere) resulted in the discovery of a new land snail for the fauna of Israel: *Cecilioides tumulorum* (Bourguignat 1856).

The systematic position and nomenclature of *Thiara scabra* (Müller 1774), a rather aggressive invasive tropical freshwater snail, was revised and its current name reads *Pseudoplotia scabra*. In addition the distribution in Israel of two invasive freshwater snails of North-American origin: *Pseudosuccinea columella* (Say 1817) and *Planorbella duryi* (Wetherby 1879), has been summarized. The

data were based on the literature and samples in the National Mollusc Collections at the Tel Aviv University and the Hebrew University of Jerusalem.

New Lessepsian migrants continue to turn up along the Mediterranean coast of Israel. Fieldwork carried out by Sigal Shefer and Tamar Feldstein resulted in the discovery of *Mimachlamys sanguinea* (Linnaeus 1758) near Ashqelon and Palmahim. This Indo-Pacific species which lives also in the Red Sea proper had never been reported before from the Mediterranean Sea.

Another new Lessepsian migrant is *Alectryonella plicatula* (Gmelin 1791) of which material has been collected by Revital Ben-David Zaslow near Palmahim.

Two other Lessepsian migrants of which only single specimens had been collected so far along the Mediterranean coast of Israel, seem to have established viable populations in our area: *Septifer forskali* (Dunker 1855) and *Alectryonella crenulifera* (Sowerby 1871). Both are common epibionts on *Spondylus spinosus* Schreibers 1793 and *Chama pacifica* Broderip 1834, which are Lessepsian migrants themselves.

Since shortly two of us (HKM and OR) are cooperating with George Konstantinou on a revision of the terrestrial and aquatic inland mollusc fauna of Cyprus.

New material, identification and computerization

The research project dealing with "The impact of biological invasions and climatic change on the biodiversity of the Mediterranean Sea", carried out by Dr. M. Goren and Dr. B.S. Galil, finished during the academic year 2011/2. Few molluscs were collected during the commercially carried out trawls and they belonged all to rather common species.

Also this year we identified large numbers of littoral Limpet-like gastropods, which had been collected by Dr. E. Shefer (Israel Oceanographic & Limnological Research Institute, Haifa) at permanent stations along the

Mediterranean coast of Israel for her research on the presence of residues of heavy metals in the autochthonous species of *Patella* and the allochthonous Lessepsian migrants *Cellana rota* (Gmelin, 1791) and *Siphonaria crenata* Blainville, 1827.

Mrs. S. Vaisman brought us for identification some 20 samples of land snails intercepted by inspectors from the Plant Protection & Inspection Services of the Ministry of Agriculture., which were found mainly on agricultural and horticultural merchandise destined for export. Mrs. Vaisman is a regular visitor of the mollusc collection in order to become more acquainted with the land- and freshwater molluscs of Israel, with special emphasis on the economically important species among them

New material was also regularly received from colleagues and friends in Israel and abroad (see new acquisitions).

During the academic year we received the shell collection of Uri J. Bar-Ze'ev (Ramat Gan). This collection consisted primarily of terrestrial snails from Israel. In addition there were also interesting samples from abroad, among others from Greece, former Yugoslavia, U.S.A., Thailand, Vietnam and China. So far 1071 samples of his collection have been incorporated in the National Mollusc Collection.

Between all these various activities we have maintained our focus on the incorporation of the very large collection of Zvi Orlin into the general Mollusc Collection. More than 6327 samples have now been registered and properly labelled, but it will take still some time till we will finish the job. The identifications are being carried out by Henk Mienis and Oz Rittner while the latter is also dealing with the computerization and labelling of the material.

At the moment 57206 samples representing 8489 taxa in the mollusc collection have been computerized. The majority of the new species and subspecies which

we could add this year to the collection were again mainly from the collection of Zvi Orlin with some interesting samples from the collection of Uri J. Bar-Ze'ev.

Cooperation with the Nature Reserves and National Parks Authority

The cooperation with the Nature Reserves and National Parks Authority (NRNPA) has resulted in the publication of 'A Field Guide to the Molluscs of Inland Waters of the Land of Israel' in Hebrew and was authored by Dana Milstein, Henk K. Mienis and Oz Rittner. This 54 page full colour guide was written in principal for the rangers of the NRNPA in the hope that it will become an important tool for identifying fresh water molluscs in the field. For this purpose also a set of four "waterproof" plates has been produced and a large poster showing all the species treated in the guide.

It is possible to download the guide from both the websites of the Nature Reserves and National Parks Authority and of the Steinhardt National Collections of Natural History.

New acquisitions

New material, not only from colleagues at various institutes but also from private collectors and even from the legacies of deceased collectors, has arrived regularly during the past year. All these new samples are immediately identified and prepared for permanent storage.

During the academic year 2011/2012 material has been received directly or indirectly from the following persons:

Name	Brief description of the material
D.E. Bar-Yosef Mayer	Land snails Israel
O. Bar-Yosef	Marine mussels North America
U. Bar-Zeev	Molluscs world wide
M. Blecher	Land and freshwater snails Israel
H.J. Bruins	Land snails Israel and Crete
A. Fast	Land snails Tanzania
T. Feldstein	Marine molluscs Eastern Mediterranean
B. Galil	Marine molluscs Eastern Mediterranean

E. Gavish	Land snails Israel
J. Grego	Land snails world wide
M. & K. Keppens-Dhondt	Marine molluscs world-wide
O. Kolodny	Land and freshwater molluscs Israel
F. Liberto	Land snails from Sicily
R. Loew	Marine bivalves Thailand
D. Mienis	Land snails Israel
H.K. Mienis	Land snails Israel and the Netherlands
D. Milstein	Freshwater snails Israel
O. Orlov-Labkovsky	Land snails Switzerland
O. Rittner	Land and freshwater molluscs Israel
S. Shefer	Marine molluscs Eastern Mediterranean
Y. Sinai	Land snails Israel
B.S. Singer	Marine micro-molluscs Eastern Mediterranean and Gulf of Aqaba
N. Stern	Marine molluscs Mediterranean coast of Israel
J.S. Torres Alba	Land snails and freshwater molluscs from Spain
S. Vaisman	Intercepted land- and freshwater molluscs
Z. Yanai	Freshwater molluscs Israel

Type Material

The holotype of *Oscilla galilae* Bogi, Karhan & Yokeş, 2012, a gastropod species recently discovered in the Bay of Haifa, and named after Dr. Bella S. Galil, has been permanently lodged by the authors in the type collection.

A list of type specimens present in the Mollusc Collection has been published in previous reports (Mienis, 2010, 2011 & 2012). A collation of additional type specimens located in the collection or received afterwards is given elsewhere in this report.

The Malacological library

For the library of the Mollusc Collection, a most important tool for taxonomic and systematic studies, we received some additional titles.

Our colleague Dr. Bella S. Galil donated two very important books:

Huber, M., 2010. Compendium of Bivalves. 901 pp.

Manousis, T., 2012. The Sea Shells of Greece. 381 pp.

Other new books donated by Henk K. Mienis included:
Dezallier d'Argenville, A.-J., 1780. Shells. Conchology or the Natural History of Sea, Freshwater, Terrestrial and Fossil Shells. (A facsimile edition of the plates of the Favanne Edition of Dezallier d'Argenville's famous book with modern interpretations of his figures published by 'Taschen' in 2009).

Seba, A., 1734-1765. Cabinet of Natural Curiosities. 415 pp. (A facsimile edition of all his plates published by Taschen in 2011).

Bijl, A.N. van der, Moolenbeek, R.G. & Goud, J., 2010. Mattheus Marinus Schepman (1847-1919) and his Contributions to Malacology. 200 pp.

Heller, J., 2011. Marine Molluscs of the Land of Israel. 323 pp. (in Hebrew)

In addition we received many reprints and again numerous journals from Zoological Institutes or Malacological Societies in exchange of "Triton", the malacological journal published by the Israel Malacological Society.

THIRD ADDITION TO THE CATALOGUE OF TYPE SPECIMENS IN THE MOLLUSC COLLECTION OF THE TEL AVIV UNIVERSITY

Henk K. Mienis

Type material of thirteen taxa is added to the provisional lists of type specimens present in the Mollusc Collection of the Tel Aviv University (Mienis, 2010, 2011 & 2012). All type samples are from shell collections received for the Mollusc Collection during the academic year 2011/12.

GASTROPODA

Family Melanopsiidae

Melanopsis meiostoma Heller & Sivan, 2000
Paratype TAU MO 73669: Israel Golan Heights, 'En Haruv.

Family Moitessieriidae

Paladilhia (?) *vobarnensis* Pezzoli & Toffoletto, 1968
Paratypes TAU MO 75413/10: Italy, Brescia, Vobarno, Funtani Caveretta di Nalmase.

Family Belgrandiidae

Belgrandia mariatheresiae Giusti & Pezzoli, 1972
Paratypes TAU MO 75416/10: Italy, Ancona, Fabriano, Fonti di S. Cassiano.

Family Triviidae

Trivirostra ginae Fehse & Grego, 2002
Paratype TAU MO 751834: Philippines, Mactan Island, Punta Egano.

Family Pyramidellidae

Oscilla galilae Bogi, Karhan & Yokeş, 2012
Holotype TAU MO 73668: Israel, Haifa Bay, 10.5 m depth.

Family Clausiliidae

Acanthophaedusa reductans Grego & Szekeres, 2011
Paratype TAU MO: 75419: China, Guangxi Province, Hechi Prefecture, Dahua County.

Columbinia riedeli Grego & Szekeres, 2008
Paratype TAU MO 75417: Colombia, Departemento Huila, between Timana and Elias.

Lindholmiela ahuiri Grego & Szekeres, 2011
Paratype TAU MO 75411: Laos, Houaphan Province, Vieng Xai.

Phaedusa pygmaea Grego & Szekeres, 2011

Paratype TAU MO 75412: Laos, Louangphrabang Province, Hat Sao (Nong Khiaw).

Selenophaedusa diplochilus griffithsi Grego & Szekeres, 2011
Paratype TAU MO 75418: China, Guangxi Province, Chongzuo Prefecture, Fusui County, 6 km NE of the Fusui Rare animal Protection Station near Qu Bangcun.

Serriphaedusa boisseaui Grego & Szekeres, 2011
Paratype TAU MO 75420: China, Sichuan Province.

Family Cerionidae

Cerion ramsdeni de la Torre in Welch, 1934
Paratype TAU MO 75414: Cuba, Playa Rincon, Ensenada de Mora, Oriente.

Cerion (Strophiops) russelli Clench, 1938
Paratypes TAU MO 75415/2: Bahamas, Cat Island, Turtle Cove.

Acknowledgements

I like to thank Dr. Jozef Grego (Slovakia) for donating paratypes of Clausilid species which were recently described by Grego and Szekeres.

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Giusti, F. & Pezzoli, E., 1972. Notulae Malacologicae, XVII. *Belgrandia mariatheresiae* n.sp. dell'Appennino marchigiano e nuove considerazioni sui generi *Pseudamnicola* e *Belgrandia.* Archiv für Molluskenkunde, 102 (4-6): 201-210.

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Pezzoli, E. & Toffoletto, F., 1968. Una nuova specie di *Paladilhia* delle Prealpi Lombarde (Gastropoda, Prosobranchia). Archiv für Molluskenkunde, 98:117-120.

Welch, A. D'Alte, 1934. New Cuban land shells from Oriente and Camaguay Provinces. The Nautilus, 47 (3): 104-108, plt. 11.

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 some of the new collecting activities of our scientists.

Collecting trips of the Entomology

Leonid Friedman

Israel: Several dozens of collecting trips were made along the year. 176 localities were visited for collecting. The main collecting method was sweeping, although a lot of collecting was made by light trapping and with the Malaise traps. Overall slightly more than 8000 specimens of insects from different orders were collected.

Dr. Netta Dorchin visited in Berlin, **Germany** (10-16.iv.2012), searching for Asteracea plants suspected as hosts of *Ozirhinchus* spp. (Cecidomyiidae, Diptera) and in Lewisburg, Roanoke and New York, **USA** (14-26.iv.2012), collecting various gall midges species (Cecidomyiidae, Diptera) from *Solidago* and *Achillaea*.

Dr. Wolf Kuslitzky worked with collection of Ichneumonidae in Zoological Institute, St. Petersburg, **Russia** and Zoological Museum of Moscow University, Moscow. Russia, in September 2011.

Ittay Renan visited in the Natural History Museum, London, **UK** (6 days), the University of Cambridge, **UK** (1 day), and the Università Roma Tre, **Italy** (3 days), working on the collections of Carabidae (Coleoptera), studying the *Graphipterus serator* species group. 418 specimens of G. serrator species group

were located, recorded and photographed; types were studied; new distributional data were obtained. The visits were funded by ITI travel grant for training abroad and Constantiner Institute for Molecular Genetics Travel Scholarship grant.

Laibale Friedman visited in Lombardia, Trentino and Veneto, **Italy** in August 2012. One day was dedicated to collecting in the southern part of Monte Baldo, a ridge parallel to Lake Garda, which stretches for 40 km, between the lake to the west and Val d'Adige to the east, and on the south it is bounded by plain Caprino and North Valley Loppio, reaching its maximum elevation of 2,218 m. The collecting was performed mostly in the surroundings of the village of Prada, around 1000 m a.s.l., in the forest comprising deciduous trees (*Alnus*, *Betula*, *Corylus*, *Rubus*), *Juniperus* and various annuals (e.g. *Urtica*, *Campanula*, *Verbascum*). More than 300 specimens of insects were collected, mostly weevils (Apionidae, Curculionidae), beetles (Coleoptera), flies (Diptera), wasps (Hymenoptera) and bugs (Hemiptera).

Collecting Trips 2010-2012

Kravchenko Vasiliy And Yefremova Zoya

Ethiopia. July-August 2010.

1) Trip from Addis Ababa to Eastern Ethiopia (Addis - Awash – Harar - Dire Dawa - Jijiga). Biotopes. Highland Ethiopian savanna with elevations 1500 – 3000m. Plains mostly covered by agricultural fields of teff, sorghum, corn. Natural biotopes normally can be found in steep canyons, or on elevation 3000m and more (Afro mountain forests).

Method of collecting and material collected. On a way to Jijiga were organized 8 stations with 2, 3 automatic light-traps, 1, 2 Malaise traps and 50 – 100 Pitfall traps (yellow pans traps). On the way back material was collected and packed from these traps. Insects with diurnal activity were collected by net during the

trips. All together about 7000 specimens of Lepidoptera collected, 1000 – Coleoptera, 500 – Hymenoptera and 200 Diptera.

Visits and contacts. Haramaya University, Faculty of Agriculture and Environmental Sciences. Working with collection of local insects.

2) Trip from Addis Ababa to Southern Ethiopia (Addis – Debre Zeyit – Soddo – Arbaminch - Jinka).

Biotopes. Highland Ehiopian savanna on elevations 1000 – 2500m. On south Natural savannas and Mountain forests and Tropical river forests (Mago National Park).

Method of collecting and material collected. On a way to Omo Region were organized 9 stations with 2, 3 automatic light-traps, 1, 2 Malaise traps and 50–100 Pitfall traps. On the way back material was collected and packed. Insects with diurnal activity were collected by net during this trip. All together about 5000 specimens of Lepidoptera collected, 8000 – Coleoptera, 300 – Hymenoptera and 100 Diptera.

Visits and contacts. Arba Minch University, Nechisar National Park, Crocodile Park, Mago National Park.

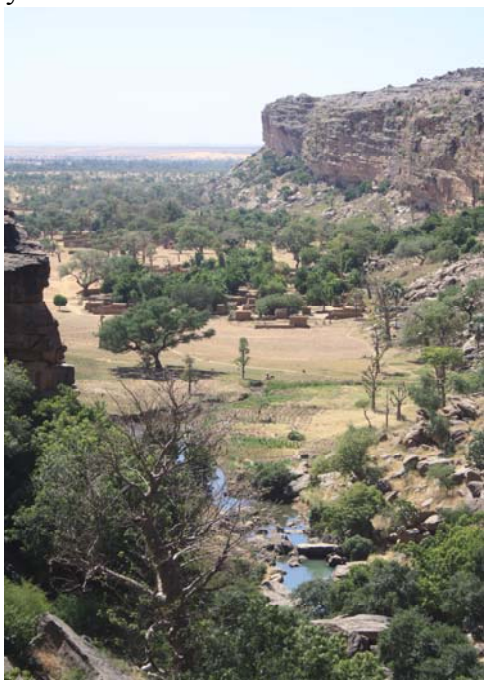
Mali. November, December 2010, Januar y 2011

1) Field camp in Inner delta of river Niger (Mopti region).

Biotopes. Big area of Lagoons in Sahel zone. Heavy grasslands on the edges of the watercourses.

Method of collecting and material collected. Many Light Traps, CDC – tarps, CO2 traps, bait traps, Malaise traps and Pitfall traps were installed in the area. All together about 20000 specimens of Lepidoptera collected, 3000 – Coleoptera, 1000– Hymenoptera and 2000 Diptera (for example Dolichopodidae –the paper was published in 2011).

Visits and contacts. Malaria Research and Training Center, Faculty of Medicine, Pharmacy and Odontostomatology, University of Bamako.



2) Dagon plateau.

Biotopes. Small, stony hills covered predominately by grassland and bushes on elevation 300 – 530m.

Method of collecting and material collected. Four stations with 2, 3 automatic light-traps, 1, 2 Malaise traps and 50 – 100 Pitfall traps were organized. All together about 1000 specimens of Lepidoptera collected, 500 – Coleoptera, 200 – Hymenoptera.

3) Southern Mali. Field camp in Kenieroba and Sikasso regions.

Biotopes. Riverine forest is situated along the Niger River.

Method of collecting and material collected. Six stations with 3, 5 automatic light-traps, 1, 2 Malaise traps and 50 – 100 Pitfall traps were organized. All together about 10000 specimens of Lepidoptera collected, 500 – Coleoptera, 200 – Hymenoptera.

Vietnam. December 2011, January 2012.

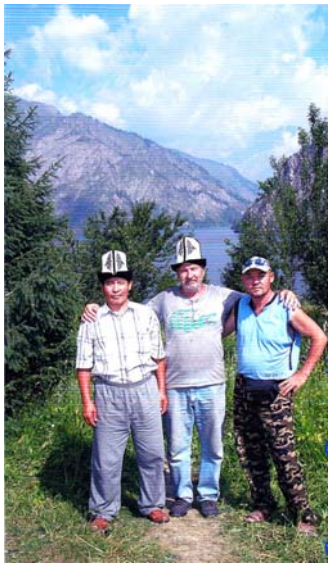
Southern Vietnam. Cát Tiên National Park.

Biotopes. Evergreen tropical and deciduous forest, dominated by Dipterocarpaceae, Fabaceae and Lythraceae (especially Lagerstroemia spp.), with 40% of the park comprising bamboo woodland, and the remaining 10% farmland, wetlands and grassland.

Method of collecting and material collected. Five

Light Traps, Malaise traps and Pitfall traps were installed in different areas of the natural Reserve. All together about 2000 specimens of Lepidoptera collected, 500 – Coleoptera, 300 – Hymenoptera.

Kyrgyzstan. June –July 2012.



Biotopes. Mostly mountain forests and alpine meadows on elevation 1500 – 3000m.
Method of collecting and material collected. Fourteen stations with 1, 2 automatic light-traps, 1 Malaise traps and 10 Pitfall traps were organized all over country. All together about 6000 specimens of Lepidoptera collected, 300 – Coleoptera, 100 – Hymenoptera (Bumblebees were identified already and prepared draft for publishing).
Visits and contacts. Institute of forest, Bishkek.

Activity report: Hudi Benayahu, 2011/12

Yehuda Benayahu

1. Comprehensive collection of soft corals of the family Xeniidae was conducted by Y. B. in Green Is. Taiwan during September 2012. Ca 75 samples were collected in various sites and habitats there. This trip was an additional survey in the pacific island of Taiwan, following two previous ones. Its goal was to investigate the xeniid biodiversity in the region. The collection obtained a variety of specimens which were preserved for classical taxonomic identification and for DNA sequencing. The results will be used for constructing the phylogeny of the family and in particular to elucidate the taxonomic status of the two closely related genera, *Efflatounaria* and *Cespitularia.*

2. During a visit to Vienna Natural History Museum (April, 2012) as a SYNTHESYS fellow, type material and non-type material was examined. The old Red Sea material of the "Pola" expedition was carefully examined along with other Indo-Pacific one. All types were photographed. Small pieces were removed from them and later will be used for preparation of permanent slide mounts to be used as reference while identifying material of that genus. During that visit some type material which has been considered lost were found and will be redescribed.

Survey of Parasites of Freshwater Snails in Israel

Roni Yizhar, Yael Dagan, Michal Ucko and Frida Ben-Ami

Background. The ITI-funded survey of freshwater snails and their parasites aims at (i) identifying freshwater-snail-infecting parasites in Israel using comparative morphology and molecular techniques, and (ii) surveying both indigenous and introduced freshwater gastropods. It is partly driven by the invasion and establishment in Israel of two freshwater snails, *Tarebia granifera* and *Thiara scabra*, which may serve as intermediate hosts of parasitic trematodes that cause diseases in humans and livestock, as well as by the recent emergence in several fish farms in the Beit She'an Valley of a trematode previously found in an aquarium harboring tropical fish. Parasites play a vital role in the maintenance and regulation of biodiversity, both through their hosts and via other free living species that rely on these hosts. Invading parasites and the infectious diseases they transmit have also become a major threat to wildlife conservation and endangered species, by influencing host genetic diversity and altering species composition. Although comprehensive databases of indigenous and non-indigenous freshwater gastropods of Israel have been compiled recently, knowledge of their parasites and how they interact with native vs. introduced snails is still lagging behind. This lack of knowledge stands in

striking contrast with important public health and agricultural implications of snail-infecting parasites in freshwater bodies in Israel, because adult stages of many trematodes are non-fastidious in their choice of definitive hosts. Introduced gastropods can aggravate the situation either by transmitting invasive pathogens or through increased resistance to native parasites which allows them to outcompete native snails. Ultimately this study will serve as a basis for future research in conservation biology that may improve our current understanding of the players affecting freshwater gastropod fauna in Israel and assist in developing effective eradication and containment schemes to the benefit of agriculture and public health.

Preliminary Results. We found that the invading snail species *T. scabra* and *T. granifera* have extended their distribution to new areas in Israel. *Thiara scabra*, which became the most abundant snail in the Sea of Galilee in just a few years, has also spread to the Bet She'an Valley and the West Coast of Israel, and is now abundant in Ein Afek nature reserve and Taninim stream. *Tarebia granifera*, which was first found in proximity to the Jordan River, has dispersed to a few springs in Bet She'an Valley and established in Bokek stream in the Judean Desert, where it constitutes more than 50% of the freshwater snails' community. Our findings indicate that the presence of these invading snails resulted in a significant reduction in the density of two local snail species: *Melanoides tuberculata* and *Melanopsis saulcyi*. Examination of the gonad under a light microscope revealed four types of trematodes' cercariae infecting the snails. Three types of cercariae – Parapleurolophocercous, Brevifurcate pharyngate and Virgulate – were found in all *Melanopsis* species. An additional type, gymnocephaluos cercaria from the genus *Philophthalmus*, was found in both invading species *T. scabra* and *T. granifera*, and in the local species *M. tuberculata* and *M. saulcyi*.

Outlook. We are in the process of identifying trematodes using molecular techniques. We managed to amplify, sequence and align the 18S (SSU) and

internal transcribed spacer (ITS) of the rDNA gene. This was done using universal trematodes primer sets, as well as species-specific primers that were developed for identifying and differentiating between various species. We expect to complete the identification process in the upcoming months.

Benthic biodiversity surveys off the Mediterranean coast of Israel

Bella S. Galil

In 2011 six campaigns was conducted off the Mediterranean coast of Israel in order to sample the benthic biota. Bella Galil, Eva Mizrahi, Hadas Lubinevsky, Liana Tidhar, Adva Shalev, Noami Ben Shushan, Nadav Kallenberg, Matan Oren, Guy Paz, Gidi Levy participated in the cruises that took place aboard the R/V Shikmona and Etziona of the National Oceanographic Institute, IOLR.

The surveys were conducted as part of baseline studies or monitoring surveys (off Palmahim, 05.2012, 09.2012, 34-37m depth, box core and trawl samples; off Ashdod, 05.2012, 08.2012, 10.2012, 6-30m depth, grab samples samples; off the coastal streams, 08.2012, 7-15 m depth, grab samples; Haifa Bay 08.2012, 5-18m depth,).

Ichthylogical Laboratory

Menachem Goren

As part of the ongoing study on the impact of the continuous invasion of Red Sea species into the Mediterranean, heavy overfishing and sea warming, we have conducted research cruises off the coast of Ashdod, using the fishing vessel Motty (a trawler), captained by Mr. Levy Ornoy.

We are currently focusing on examining the relationship between the gradient of water depth and structure of the marine community, and the role that the

invasive species play at the different depths. We sampled the biota at depths of 20, 40, 60, 80, 100, 120, 250 and 400 m, and found significant differences in their composition at the different depths. The material was brought to the ichthyological laboratory where it was sorted, identified, measured and examined. Some species were studied for stomach content and reproductive stage. Part of the catch has been preserved and deposited in the fish and invertebrate sections of the National Collections. Preliminary findings reveal that over the last three years the alien species have extended their distribution to deeper waters. We intend to continue this research to the end of 2012.

Figure 1: Celebrating five years of cooperation between the team of the Ichthylogical Laboratory and Captain Levy Ornoy (poster- Nir Stern).

Malacological field work in Israel

Henk K. Mienis and Oz Rittner

Field work in Israel
During the academic year 2011-2012 fieldwork has been carried out regularly in Israel by Henk Mienis and Oz Rittner

The following localities have been visited:
Givatayyim – 07.11.2011:
Subject: The status of *Xerocrassa davidiana picardi* on the destroyed remains of Giv'at Kozlovsky and a general survey of the land snails inhabiting that kurkar hill.

Results: Less than five living specimens of *Xerocrassa davidiana picardi* were found in an area of a few square meters still covered with the original vegetation. The last stronghold of this extremely rare and endangered taxon is now more or less completely destroyed. In spite of our continues warnings (Rittner & Mienis, 2011) we failed in encouraging local rangers of the Nature Reserves and National Parks Authority to show any interest in the problematic matter in order to save *Xerocrassa davidiana picardi* from becoming extinct.

Mount Hermon – 15.12.2011:
Subject: A survey of the terrestrial mollusc fauna of Qala'at Nimrod, Newe Ativ, Lower Ski Lift and Banyas.

Main results: At the Nimrod Fortress eight species were found in a soil sample which had not been recorded before from that site on Mount Hermon (Mienis, Rittner & Vaisman, 2012a).

Cecilioides tumulorum was found in an ant nest cleaning in the Newe Ativ Park. It is the first record of this species from Israel in general and Mount Hermon in particular (Mienis, Rittner & Vaisman, 2012b).

Giv'at Mrar – 03.01.2012:
Subject: A survey of the land snails living on Giv'at Mrar, a kurkar hill situated west of the road between Rehovot and Gedera.

Main results: Eight different species were encountered of which *Levantina spiriplana hierosolyma* is well outside its natural range of distribution on Giv'at Mrar. Since it is an edible species we do not rule out the possibility that living specimens were brought to Giv'at Mrar already during ancient times.

Ramat Aviv – 26.01.2012:
Subject: A general survey of the land- and freshwater molluscs living in the Botanical Garden of the Tel Aviv University with special attention to the presence of exotic species.

Main results: Very large specimens of the invasive freshwater gastropods *Physella gyrina* and *Pseudosuccinea columella* were encountered in the pool at the end of the channel in the so-called En Gedi oasis (Mienis & Rittner, 2012a & b).

In one of the hothouses the following exotic land snails and slugs were found: *Elia moesta moesta*, *Hawaiia minuscula*, *Lamellaxis clavulinus*, *Lehmannia valentiana*, *Vallonia pulchella* and *Zonitoides nitidus.*

Northern Negev – 31.01.2012:
Subject: A general survey of the land snails living in the vicinity of Nahal Kovshim, Tel Beersheva and Mamshit with special attention to the presence of species belonging to the genus *Xerocrassa.*

Main results: No spectacular finds were made during the survey. However the living specimens of *Sphincterochila fimbriata* and *Sphincterochila zonata* are now being used for a comparative study of the DNA of *Sphincterochila* species from the Iberian Peninsula and North Africa by a Spanish team. Likewise the living specimens of *Xerocrassa seetzenii* and *Xerocrassa tuberculosa* will be

just for a comparative study of the anatomy of the specimens from Israel and a *Xerocrassa* species from the Eastern Adriatic coast by a colleague in Italy.

Sidni Ali, Tel Arsuf (Apollonia), Park HaSharon, 21.02.2012:
Subject: Land snails of kurkar rocks.

In vain we searched for living specimens of *Xerocrassa davidiana davidiana.* Another typical species for kurkar outcrops *Sphincterochila aharonii* was commonly encountered. Just south of the mosque of Sidni Ali a single empty shell of *Rumina saharica* was found, which has to be considered a rather old introduction.

Bareqet rainpool, Zarta Rainpool, Mazor Mausoleum and Migdal Zedeq, 2.03.2012:
Subject: Survey of the winter rain pools Bareqet and Zarta, N.E. of Shoham in cooperation with Dana Milstein of the Nature Reserves and National parks Authority.

Results: Both pools contained axial ribbed specimens of *Bulinus truncatus.* Audouin based on similar shells figured by Savigny that Bulinid species. Near the Bareqet pool fair numbers of *Cristataria haasi kharbatensis* and *Levantina spiriplana werneri* were found. Both near the Zarta pool and Migdal Zedeq relatively small specimens of *Gigantomilax (Vitrinoides) eustrictus* were collected.

Ma'ale Adumim, Mishor Adumim and Kefar Adumim, 02.04.2012:
Subject: An additional search for living specimens belonging to the genera *Sphincterochila* and *Xerocrassa* in support of the projects of our Spanish and Italian colleagues.

Results: In addition to *Xerocrassa seetzenii* also some living specimens were collected of *Xerocrassa langloisiana.* Some living specimens of two other populations of *Sphincterochila fimbriata* were also sampled.

Remark: Near Kefar Adumim we visited a small firm were 'Biblical Tekhelet' is being produced for the colouring of the tassels of prayer shawls.

Mount Hermon, 28.06.2012:
Subject: Continuation of the land snail survey of Mount Hermon:

Results: Hardly any snails were found due to the severe dryness of all the surveyed habitats. Additional surveys should be carried out during the rainy season i.e. in the winter of 2012/13.

Malacological fieldwork in the Netherlands

Henk K. Mienis

From 12 September till 15 October 2012 I visited again my native the Netherlands. Malacological fieldwork was carried out from time to time in the provinces Friesland and North-Holland.

This fieldwork was carried out with the following objectives:

Friesland:

a. A follow up survey of the presence of (semi-)aquatic molluscs in the Formerumerwiel, a brackish water lake caused by an ancient dike collapse on the island Terschelling;
b. A first survey of the freshwater mollusc fauna of the "Eerste Plak" (a wetland) in Lies, Terschelling;
c. A follow up survey of an artificial dune lake near Hee, Terschelling**;**
d. A general survey dealing with the presence of several invasive land snails and slugs on Terschelling;

North-Holland:

e. A first survey of a cemetery near the Overweersepolderdijk, Purmerend, for the presence of land snails and slugs;
f. A follow up survey of the Jewish cemetery in Monnickendam for the presence of terrestrial snails and slugs;
g. A search for new localities of *Hygromia cinctella*, an invasive land snail;
h. A further survey of the presence of molluscs near an inundation sluice in Zuid-Oost-Beemster;
i. A second survey of the mollusc fauna of the Lighthouse Island near Durgerdam.

Results

-Formerumerwiel, Terschelling.

Six species of (semi-)aquatic species had been reported so far from this lake (Mienis, 2011). Also during the survey carried out on 28.09.2012 the same number was encountered in that wetland. However instead of *Haitia acuta* this time *Galba truncatula* was encountered and even in large numbers. This semi-aquatic gastropod is a well-known intermediate host of the Liver fluke *Fasciola hepatica*, which may cause serious damage to sheep. The presence of dense populations of *Galba truncatula* might have a negative effect on the health of the sheep, which are often grazing in the surrounding meadows.

-"Eerste Plak", near Lies, Terschelling.

A first survey of this wetland revealed the presence of only four freshwater molluscs: *Radix balthica*, *Ferrissia clessiniana*, *Planorbis planorbis* and *Musculium lacustre.*

Ferrissia clessiniana is an invasive exotic gastropod which reached Terschelling most probably when they started to sell Water lilies in so called garden centres on the island. Excess Water lilies in garden ponds are often dumped in nearby natural waters and in this way this cap-like gastropod is slowly but steadily extending its range in aquatic biotopes on the island.

-Dune lake near Hee, Terschelling.

In the early seventies sand, used for enforcing the dikes along the Waddensea coast of Terschelling, was excavated along the foot of the dunes near Hee. Ground water filled the excavated area and created in this way a small lake. *Radix auricularia* was the first and only freshwater mollusc recorded so far from it (van Leeuwen & van Peursen, 2005). On 17.09.2012 living specimens of three species of aquatic molluscs were collected in fair numbers: the invasive exotic gastropod *Potamopyrgus antipodarum* and two common local species: *Radix balthica* and *Gyraulus albus.* Near the western bank of the lake numerous

empty shells of a Lymnaeid species were found in the drift zone. Also all these shells turned out to *Radix balthica* and not to *Radix auricularia.*

-Invasive land snails and slugs on Terschelling

During the past 10-15 years a large number of non-local snails and slugs have been recorded from the island Terschelling (*Lehmanni valentiana*, *Deroceras panormitanum*, *Candidula intersecta*, *Cernuella virgata*, *Hygromia cinctella*, *Monacha cantiana* and *Arianta arbustorum*) or the few localities which had been known already of several other species increased rapidly (*Cepaea nemoralis* and *Cornu aspersum*). The newcomers reached the island most probably by means of the import of garden plants from the mainland. Some, like *Hygromia cinctella*, are still confined to gardens, but others are freely expanding their range to more natural areas and may be classified as invasive species. The following observations concerning these newcomers are noteworthy.

Lehmannia valentiana: West-Terschelling at two different localities in the old cemetery behind the lighthouse "Brandaris".
Deroceras panormitanum: West aan Zee, north of Badhuiskuil, in the dunes.
Candidula intersecta: West-Terschelling, Dellewal (few specimens), also in the village on walls, West aan Zee, in the dunes near the Badhuiskuil (common)
Cernuella virgata: West-Terschelling, Dellewal (extremely common after and during rain over a distance of some 100 m).
Hygromia cinctella: Hoorn (in two widely separated gardens respectively at Dorpsstraat 29 and 49).
Monacha cantiana: West-Terschelling, Dellewal (very common after rain), Halfweg, Nollekes (common after rain), Oosterend-Duinweg (at the foot of the dunes and in gardens), Oosterend-Dwarsdijk (near the cycling-path).
Arianta arbustorum: West-Terschelling, Dellewal, 18 actively crawling snails near one of the benches (observation: Dana and Henk Mienis). This species occurred also over a range of about 30 m at the edge of a dense patch of *Rosa pimpinellifolia*.
Cepaea nemoralis: West-Terschelling (everywhere very common), West aan Zee (in the dunes), Halfweg, Nollekes (common), Midsland (gardens), Formerum (gardens), Hoorn (common), Oosterend (everywhere), Boschplaat, Stuifdijk at least up to pole 26.
Cornu aspersum: West-Terschelling (common in gardens, parks, cemeteries), Halfweg, Nollekes (few), Midsland, (gardens), Hoorn (common), Oosterend.

-Cemetery Overweersepolderdijk, Purmerend.

The cemetery dates from the last quarter of the 19th Century (1875). Last year it has been "renovated" and is now open for the public. Only 13 different terrestrial snails and slugs were seen among which the invasive slug *Lehmannia valentiana*. It was actively crawling on the stems of several large trees after rain.

-Jewish cemetery in Monnickendam.

This cemetery dates from the 17th Century. So far 16 different terrestrial snail and slug species had been recorded from this site (Mienis, 2012b). During the survey carried out on 02.10.2012 six additional species could be registered. Most of them were very small species like *Carychium minimum*, *Carychium tridentatum*, *Vitrea contracta* and *Cecilioides acicula*.

-New localities of the invasive land snail Hygromia cinctella.

The following six localities in North-Holland are new for this invasive species:

Purmerend, Waterland Hospital, garden; Volendam, Hellersplein, on low shrubs; Amsterdam, Nieuwedam, Beemsterstreet, in garden; Amsterdam, Buitenveldert, Neerkanne, on shrubs; Beemster, Zuid-Oost Beemster, Zuiddijk, on shrubs and nettles near the bridge over the North-Holland Channel; Beemster, Midden-Beemster, Nachtegaalstraat, on shrubs and trees. The two localities in the Beemster are the first for that municipality.

-Inundation sluice in Zuid-Oost Beemster.

Previous surveys revealed the presence of 23 different species of terrestrial and amphibious snails and slugs near the inundation sluice (Mienis, 2012a). During a visit on 09.10.2012 seven additional species were recorded. Most noteworthy was the presence of two invasive slug species: *Boettgerilla pallens* and *Milax nigricans.*

-The Lighthouse Island near Durgerdam.

Last year 21 terrestrial and 7 aquatic species of molluscs were found to live on the Lighthouse Island near Durgerdam (Mienis, 2012c). On 12.10.2012 I was able to visit this normally closed fortification belonging to the "Defence Ring

around Amsterdam" for a second time. This has resulted into the registration of seven additional terrestrial species (4 slugs and 3 snails) and three aquatic snails. The latter were found in a tiny artificial pond in the garden of the only house on this island.

All the results of this fieldwork in the Netherlands were carried out in support of the "Atlas Project of Dutch Mollusca". The most important samples are permanently stored in the Mollusc Collection of the Steinhardt National Collections of Natural History of the Tel Aviv University.

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Mienis, H.K., 2012b. Landslakken op de Joodse begraafplaats in Monnickendam. Spirula, 386: 80-81.
Mienis, H.K., 2012c. Een eerste verkenning van de malacofauna van de kustbatterij bij Durgerdam. Spirula, 388: 125-126.

Outreach - Nature Campus

Over the last decade Nature Campus has played a central part in imparting the concept of biodiversity and expanding the public's understanding of the role of the biosphere and its importance beyond the traditional concept of nature conservation. It currently offers 'science days' and guided tours, lesson plans for activities inside and outside the classroom, research workshops, and publications. This activity is not supported by VATAT but we think it fit to report it alongside other collections-based activities. In the past year alone, Nature Campus major accomplishments were:

1. **Visits of school children, families, and other audiences to Nature Campus: Zoo, Botanic Gardens and Natural history collections**
   a. Total visitation during 2011-2012 was more then 8,000 people, of which 68% were school children, 11% were families and private groups, 14% were adults and the rest were various groups.

   b. Spaceship Earth Hanuka, Passover and summer camps were a huge success with 8 groups of eager kids, mostly children and grandchildren of TAU employees, thus networking with and enriching TAU community.

   c. In addition to our usual visitors, we enjoyed over 21,600 unique visitors to Nature Campus website, a growth of 7% compared to previous year; over 15,500 unique visitors to EarthWeb (our natural resources website), a growth of 32% compared to previous year; and over 9,700 to the Collections website, a growth of 12% compared to previous year.

2. **Publications and on-line**
   a. Nature Campus website was redesigned in order to be more marketing oriented.

b. EarthWeb website continued to expand. More than 130 new web articles were added covering major themes of safekeeping planet Earth.

3. Grants & Gifts

a. A grant from the Ministry of Justice: Department of the Public Trustee and the Official Receiver (P.I.). For science for all publications on the internet. (75,000 NIS ca. $19,000).

The Israel Taxonomy Initiative

Conservation of biodiversity – the variety of life forms on earth – depends on 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; but 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; however, 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. A recent report submitted to the Israel Academy of Sciences and Humanities demonstrated that within 10 years, the average period required to train a young taxonomist, Israel would have no scientists in research or teaching positions who can train the next generation of taxonomists. 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 doctoral and post-doctoral fellowships;
- Providing funding for overseas training for graduate students;
- Providing funding for biodiversity surveys;
- Inviting taxonomists from the international scientific community to teach short courses on local species groups.

Our goal is to resurrect Israeli taxonomy and increase our knowledge of 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 to date:

Doctoral Scholarships:

2009/10: Malkie Spodek, scale insects; Ittai Renan, beetles; Noga Sokolover, moss animals. 2010/11: Karin Tamar, reptiles; Nir Stern, fish.

2011/12: Anna Halasz, corals; Roy Talbi, reptiles.

2012/13: Einat Schachar, Gall wasps; Elizabeth Morgulis, fruit flies.

Post-Doctoral Fellowships:

2009/10: Noa Shenkar, ascidians; Efrat Gavish-Regev, spiders.

2010/11: Noa Shenkar, ascidians; Efrat Gavish-Regev, spiders; Alla Alster, blue-green algae.

Biodiversity surveys:

2009/10: Dorothee Huchon, sponges; Menachem Goren, fish; Leonid Friedman and Amnon Freidberg, Entiminae beetles; Amit Dolev, bats.

2010/11: Nehama Ben-Eliahu, serpulid worms; Jean-Jacques Itzhak Martinez, ants; Frida Ben-Ami, flukes; Vasiliy Kravchenko, moths; Amnon Freidberg and Elizabeth Morgulis, flies; Ariel Chipman, centipedes.

2011/12: Oz Barazani, crucifer plants; Guy Bloch, bees; Leonid Friedman and Amnon Freidberg, snout beetles; Netta Dorchin, gall midges; Dotan Rotem and Ittai Renan, insects; Shai Meiri, reptiles; Sigal Shefer, demosponges; Yossi Loya, stony corals.

2012/13: Ada Alamaru, Yossi Loya & Dorothee Huchon, Ctenophores; Leonid Friedman, Red Weevils; Netta Dorchin and Zvi Mendel, midges; Sigal Shefer, Tamar Feldstein & Micha Ilan, demosponges; Ehud Spanier & Jason Goldstein, decapods; Yossi Loya, Mesophotic corals.

Overseas training for students:

2010/11: Karin Tamar, reptiles; Ittai Renan, beetles.

2011/12: Anna Halasz, corals; Achik Dorchin, bees; Ittai Renan, beetles; Rebbeca Biton, reptiles and amphibians; Noga Sokolover, Moss animals; Naama Kimmerling, coral reef fish larvae.

2012/13: Haggai Wasserstrom, acarology; Yonathan Guttel, freshwater mollusks; Achik Dorchin, bees; Karin Tamar, reptiles; Naama Kimmerling, coral reef fish larvae; Philip Nemoy, Sponges;

Visiting Scholars:

2010/11: David Furth, leaf beetles; Dmitry Apanaskevich, ticks; Gregory Evans, mites; Krzysztof Szpila, flies; Christophe Praz, bees; John Heraty, parasitoid wasps.

2011/12: Rony Huys, crustaceans; Roman Romanov, green algae; Marco Bologna, blister beetles; John Ascher, Bees; Torsten Dikow, flies; Edward Ueckermann, mites.

2012/13: Robert Raven, spiders; Philipp Wagner, reptiles; Olof Biström, diving beetles; Lorenzo Prendini, scorpions.

New museum faculty and staff

Curators

Noa Shenkar, Department of Zoology

Noa Shenkar graduated from Tel-Aviv University, where she carried out her Ph.D. and M.Sc. studies under the supervision of Prof. Yossi Loya, Zoology Department. Her research focused on ecological aspects of the ascidian (Chordata, Ascidiacea) fauna along the coasts of Israel, Mediterranean and Red Sea. While spending many hours underwater investigating the local ascidian fauna, Noa has established a unique ascidian collection at the National Collection of Natural History at Tel-Aviv University, which allows the combination of both classical morphological studies, and advanced molecular research. Following a short post doctoral appointment at the TAU collection, Noa continued her post doctoral research at the Depratment of Biology, University of Washington, USA, with Prof. Billie Swalla. Her research there was focused on phylogenetic of the class Ascidiacea. In addition, during this time she was personally trained in ascidian taxonomy by Miss Gretchen Lambert, the only professional taxonomist of this group in the USA. Their joint effort resulted in the discovery of several new species to science from the coasts of Israel. Noa's unique approach of combining ecological, morphological and molecular tools in her studies, allow her to use the ascidians as a model group for the study of a variety of environmental topics such as biological invasions, global warming, loss of biodiversity and more. In her new position at Tel-Aviv University, Noa is once again a part of the National Collections of Natural History, where she serves as an associate curator of the

marine invertebrate collection. Noa has recently been awarded the prestigious European Union Marie-Curie Career Integration Grant. Her current research is dedicated to the study of Red-Med marine bioinvasions through the Suez Canal, and will include the establishment of an advanced early warning system for the detection of introduced fauna along the coasts of Israel.

Dafna Langgut, Institute of Archeology

Dafna Langgut graduated from Haifa University in 2008 where she carried out PhD research under the aegis of the Israeli Geological Survey (Jerusalem). Her dissertation dealt with vegetation and climate reconstruction based on fossilized palynomorphes (pollen, spores and dinoflagellates) extracted from eastern Mediterranean marine cores of the last 90,000 years. She then conducted one year of postdoctoral research at the Department of Plant Science, Tel Aviv University and focused on the taxonomy of the genus Tamarix and on allergenic pollen grains. She is now completing her second postdoctoral research, at the Department of Archaeology and Near Eastern Cultures at Tel Aviv University as part of the project, "Reconstructing Ancient (Biblical) Israel: The Exact and Life Sciences Perspective." Within this research she studied in high resolution the past vegetation of ancient Israel during the Bronze and Iron Ages and the past relationship between humans and the environment, such as the onset of agriculture, de-forestation and settlement history. Dr. Langgut also extracts botanical remains from archeological sites and deals with utilization patterns for living spaces, diet, plant usage, agricultural practices, plant importation, ancient gardens and seasonality of site occupation. Her research is based on a comparative reference collection of botanical remains. Therefore part of her time is dedicated toward building a detailed, well-preserved micro and macro botanical collection. She is slated to become a researcher at the Institute of Archaeology and the curator of Archaeobotany.

Jonathan (Yoni) Belmaker, Department of Zoology

Yoni Belmaker graduated from Ben Gurion University , where he carried out his PhD research under the supervision of Dr. Yaron Ziv and Dr. Nadav Shashar studying the processes that influence the diversity of fishes on coral reefs. After submitting his dissertation, Yoni was awarded a Rothschild post-doctoral fellowship to study the global trait diversity of terrestrial vertebrates at Yale University with Dr. Walter Jetz. His study focused on assessing the ability to predict the composition, structure and function of vertebrate communities across scales. This global, synthetic view directly addresses the troubling gap between macroecological scales (100-200km) and the finer-scales where species interaction and conservation decisions take place. In his new position at Tel Aviv University, Yoni is once again studying fish. 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 natural history fish collection thus provides a globally unique resource that Yoni will use 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.

Post-doctoral fellows

Efrat Gavish Regev. I am a spider systematist with a solid background in entomology, agroecology and ecology. I am interested in the evolutionary and ecological processes that underlie arthropod diversification and speciation, and especially in the evolution of spider genitalia. I use sheet-web spiders (Linyphiidae) as a model group due to their worldwide distribution and tremendous diversity. Currently only seven linyphiid species are reported from Israel, however, I have found already 40 species in a collections-based research which I am conducting at the Zoological Museum, TAU. My long term goals are to identify and describe the arachnid and especially the linyphiid fauna of Israel, and to promote research and teaching in the fields of systematics and arachnology. I am serving as an additional advisor of two master students in the field of spider systematics and I am one of the founders of the Israeli Association of Arachnology.

Annat Haber. My main research interest is the evolution of complex characters and their role in structuring diversification patterns. I study covariation among morphological characters as a proxy for the intrinsic trade-offs and constraints structuring the variation that is available for natural selection to work on. I use a combination of morphological analyses and computer simulations to address questions such as: how does character covariation affect the potential of species to evolve and diversify; how does the covariance structure within species correspond to character co-variation across species; how can the within-species covariance structure inform out definition of homology for the purpose of phylogenetic reconstruction. My work on the ruminant skull has yielded unique insights regarding the association between

character covariation and diversification, illustrating the importance of incorporating intrinsic factors into studies of biodiversity.

Roi Dor. My research combines field and lab experiments with the use of molecular techniques to address fundamental questions in behavioral ecology and evolutionary biology, such as the genetic basis of signal behaviors and the role of mate choice in speciation. As both a behavioral ecologist and an evolutionary biologist, I am interested in the adaptive nature of traits and the role they play for generation and maintenance of biodiversity. I integrate behavioral ecology and evolutionary biology through hypotheses-driven experiment testing of proximate mechanisms, quantitative genetics, historical inferences, phylogeny reconstruction, and species-level comparative analysis. My main research interests concerns avian biodiversity and the evolution of traits, mainly in bird species.

Razy Hoffman. I obtained my M.Sc. from Tel-Aviv University and my Ph.D. (thesis by publication) from Bar-Ilan University. My scientific interests are general taxonomy (especially seaweeds, seagrasses, terrestrial plants, reptiles, mammals, birds and insects taxonomies), seaweed ecology and the biology of alien seaweed species. The main objectives of my research are: 1) to maintain and preserve the national algae and seagrasses herbarium at Tel-Aviv University, 2) to upgrade the collection of this herbarium via the addition of seaweed specimens from Israel and worldwide, 3) to identify all the species of Galaxauraceae family of the collection at the Israeli National Herbarium (Tel Aviv University and the Hebrew University of Jerusalem) via the DNA-based assistance, 4) to investigate the source and population genetics of the invasive strain of the red seaweed *Galaxaura rugoa* along the Israeli Mediterranean Sea, 5) to establish a

steady monitoring program that focus in alien seaweed invasion and their effects on local marine flora.

Gil Koplovitz. I completed my PhD at the University of Alabama at Birmingham where I worked on chemical ecology of ascidians from the Western Antarctic Peninsula and the Gulf of Mexico. After completion, I returned to Israel to begin a postdoctoral fellowship at Tel Aviv University in Dr. Noa Shenkar's lab, where I now work on the taxonomy and biodiversity of ascidians in the Gulf of Eilat (Aquaba).

Achik Dorchin. Since childhood I have been marveled by the diversity of forms and the esthetic of the insects. Acquiring scientific qualification, I focused my attention on the fate of native bee communities in areas disturbed by human activity. These pollinators are particularly diverse in Israel and have obvious importance to ecosystems. In my post-doc research I combine pleasure and work by studying the taxonomy of the large, yet poorly known, bee genus *Megachile*, which has also benefits to human welfare because some megachilid bees are used as commercial pollinators in agriculture.

Hila May. In my research study I am trying to reveal cultural changes based on skeletal material using various novel methodologies (e.g., imaging techniques, genetic analysis). I am studying the morphology, biomechanics and genetic properties of prehistoric skeletons dated to the transition from hunter-gatherers to agriculturalists (10,500-4300 B.C.E), i.e. Neolithic/agriculture revolution. The main goals are to understand their physical activity, food management,

kinship relationships, sex identification, sexual ratio and funerary rituals. In this study we would like to shed light on one of the most significant cultural processes in human history.

Rachel Sarig. I am a dentist (DMD), specialist in orthodontics. I Received my PhD diploma from the Department of Anatomy and Anthropology of the Sackler Faculty of Medicine at Tel Aviv University. These days I conducting further research on ancient teeth found in excavations, mainly investigating unique attrition patterns as part of her postdoctoral program.

Irina Zonstein. My main research interest is insect taxonomy and systematics. My previous research projects focused on tephritid (Diptera) and pompilid (Spider wasps, Hymenoptera) genera, the biodiversity of Central Asian Eumenidae (Hymenoptera), and studies on the Israeli fauna of Phlebotomus (Diptera: Psychodidae), Culicidae (Diptera), and Ixodidae (Arachnida: Ixodida). During my Ph.D. work I completed a taxonomic revision of two genera of Pompilidae: Xenaporus and Gonaporus with special emphasis on their phylogeny, and studied the nesting behavior of representatives of both genera. During my postdoctoral work I will study the biodiversity of the Israeli fauna of parasitic wasps of the superfamily Chalcidoidea with an emphasis on the family Eulophidae (Hymenoptera: Chalcidoidea).

Publications

The national collections of natural history are an important research infrastructure, used by scientists within and outside of the university. Here we list the 2011/2012 publications, that includes all publications of TAU members affiliated with the collections (whether they are directly collections-based or not). It under-represents publications of individuals from other institutions, since our follow-up is far from complete.

Refereed articles

1. Aharonovich, D. and Benayahu, Y. 2012. Microstructure of octocoral sclerites for diagnosis of taxonomic features. Marine Biodiversity 42: 173-174.
2. Anderson, W. D. Jr, Baranes A, and Goren M. 2011. Redecoration of the perciform fish *Symphysanodon disii* (Symphysanodontidae) Gulf of Aqaba, Red Sea, with comments on *S. pitondelafournaisei* and sexual dim in the genus. Zootaxa. 3027: 1–8.
3. Argov, Ya., W. Kuslitzky and K. Hoelmer. 2012. Biological control of olive fruit fly, *Bactrocera oleae*, in Israel. – IOBC-WPRS Bulletin vol. 79: 78-85.
4. Armoza-Zvuloni , R., E. Kramarsky-Winter & Y. Loya. 2011. Repeated bleaching events may result in high tolerance and notable gametogenesis in stony corals: *Oculina patagonica* as a model. Marine Ecology Progress Series 426:149-159.
5. Arzanov, Ju.G. and A.L.L. Friedman 2012. New species of *Brachycerus* Olivier (Coleoptera: Brachyceridae) from Turkey. Russian Entomological Journal 21(1): 53-55.
6. Atad, A., A. Zvuloni, Y. Loya and Rosenberg, E. 2012. Phage therapy of the white plague- like disease of *Favia favus* in the Red Sea. Coarl Reefs 31: 665-670.
7. Belinky F., Goldfarb I., Szitenberg A., Feldstein T., Wörheide G., Ilan M. and Huchon D. 2012. ALG11 – a new variable DNA marker for sponge phylogeny. Comparison of phylogenetic performances with the 18S rDNA and the COI gene. Molecular Phylogenetics and Evolution 63: 702-713.
8. Ben-Dor, M. Gopher A, Hershkovitz I. and Barkai R. 2011. Man the fat hunter: the demise of Homo erectus and the emergence of a new hominin

lineage in the Middle Pleistocene (ca. 400 kyr) Levant. PLoS One.6(12):e28689.

9. Bergman, O. Mayzel, B. Anderson, M. A. Shpigel, M. Hill, R. T. and Ilan M. 2011. Examination of marine-based cultivation of three demosponges for acquiring bioactive marine natural products. Marine Drugs 9: 2201-2219.

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11. Bogi, C., Karhan, S.Ü. and Yokeş, M.B., 2012. *Oscilla galilae*, a new species of Pyramidellidae (Mollusca, Gastropoda, Heterobranchia) from the Eastern Mediterranean. Iberus 30 (2): 1-6.

12. Bosmans, R. and Gavish-Regev, E. 2012. A new synonymy in a linyphiid spider from Egypt (Araneae: Linyphiidae). Serket 13(1-2): 99-103.

13. Breen P., Robinson L.A., Rogers S.I., Knights A.M., Piet G., Churilova T., Margonski P., Papadopoulou N., Akoglu E., Eriksson A., Finenko Z., Fleming-Lehtinen V., Galil B., Goodsir F., Goren M., Kremena S., Krivenko O., Leppanen J.M., Markantonatou V., Moncheva S., Oguz T., Paltriguera L., Timofte F., and F. Thomsen. 2012. Assessing risk to achieving environmental objectives: A European assessment to support regional prioritisation of management options to achieve Good Environmental Status. Marine Policy. 36: 1033–1043

14. Bronstein, O. and Loya, Y. 2011. Day time spawning of *Porites rus* on the coral reefsof Chumbe Island in Zanzibar, Western Indian Ocean(WIO). Coral Reefs 30:441.

15. Cohen, E., Koch, L., Myint Thu, K,. Rahamim, Y., Aluma, Y., Ilan, M., Yarden, O. and Carmeli, S. Novel terpenoids of the fungus *Aspergillusinsuetus*isolated from the Mediterranean sponge *Psammocinia* sp. collected along the coast of Israel. Bioorganic & Medicinal Chemistry 19: 6587–6593.

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17. Davies, J., Cooper, N., Diniz-Filho, J. A. F., Thomas, G. H. and Meiri, S. 2012. Using phylogenetic trees to test for character displacement: a model and an example from a desert mammal community. Ecology 93 (Supplement 6), S44-S51.

18. De Meyer, M. and Freidberg, A. 2012. Taxonomic revision of the fruit fly genus*Neoceratitis* Hendel (Diptera: Tephritidae). Zootaxa 3223: 24-39.

19. Dorchin N. and Adair R.J. 2011. Two new *Dasineura* species (Diptera: Cecidomyiidae) from coastal tea-tree, *Leptospermum laevigatum* (Myrtaceae) in Australia. Australian Journal of Entomology 50: 65-71.

20. Dorchin N. and Freidberg A. 2011. *Schizomyia botellus* n.sp. – a new bud galling species from Apiaceae in Israel. Zootaxa 3122: 68.

21. Dorchin N. and Freidberg A. 2011. The gall midges (Diptera: Cecidomyiidae) of Apiaceae in Israel. Zootaxa 3044: 28-48.

22. Egorenkova E.N., Efremova Z.A., Kravchenko V.D., Mishchenko A.V., 2012. Eulophidae (Hymenoptera) parasitoids of mining Gracillariidae (Lepidoptera) in forests of the Samara Region. Plant Protection News. 3: 45-49 (in Russian).

23. Eppelbaum, L.V. and Katz, Y.I., 2012. Key Features of Seismo-Neotectonic Pattern of the Eastern Mediterranean. Izv. Acad. Sci. Azerb. Rep., Geology, Ser.: Earth Sciences 3:29-40.

24. Eppelbaum, L.V., Katz, Y.I. and Ben-Avraham, L., 2012. Israel - Petroleum Geology and Prospective Provinces. AAPG European Newsletter 4:4-9.

25. Eyal, G., L. Eyal-Shaham and Loya, Y. 2011, "Teeth-anchorage": sleeping behavior of a Red-Sea filefish on a branching coral Coral Reefs 30: 707.

26. Fet V., Soleglad M. E. & Zonstein S., 2011 (published 29.11.2011) The genus *Akrav* Levy, 2007 (Scorpiones: Akravidae) revisited. Euscorpius 134: 1-49

27. Fishelson, L. Delarea Y., and Goren, M. 2012. Comparative morphology and cytology of the eye, with particular reference to the retina, in lizardfishes (Synodontidae, Teleostei), Acta Zoologica. 93:68-79.

28. Fishelson, L., Golani, D., Russell, B., Galil, B. S. and Goren, M. 2011. Rodlet cells in the alimentary tract of three genera of lizardfishes (Synodontidae, Aulopiformes): more on these enigmatic "“gate -guards"” of fishes. Cybium 35 (2): 121-129.

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31. Freidberg, A. and Han, H.-Y. 2012. A second species of *Manicomyia* Hancock (Diptera: Tephritidae: Tephrellini). African Invertebrates 53(1): 143-156.

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Accepted for publication

1. Appeltans et al. (+115 co-authors). 2012. Magnitude of global marine biodiversity: one third of sea creatures discovered. Current Biology.

2. Benayahu, Y. van Ofwegen, L.P. 2012. Octocorals (Cnidaria: Anthozoa) from Reunion, with a description of two new species of the genus *Sinularia* and notes on the occurrence of other species. Zoosytema 34.

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8. Fishelson, L, Hastings Ph. and Baldwin C. Comparison of the Orpharyngal cavity in the Starksiini (Labrisomidae, Teleostei): Teste buds and teeth, including a comparison with closly- related genera. Journal of morphology.

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13. Guershon M, Ayali A, Golenser E & Pener MP (2012) A juvenile hormone analogue enhances homosexual behaviour in female-deprived males of the migratory locust. Physiological Entomology.

14. Guershon, M. and Ionescu-Hirsch, A. Updated list of *Xylocopa* (Hymenoptera: Apidae) from Israel with a key to the Israeli species. Israel Journal of Entomology.

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Chapters in books

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2. Horwitz, L.K., Hellwing, S., Lernau, O. and Mienis, H.K., 2012. The faunal remains and the functioning of the site. In Z. Meshel (Ed.): Kuntillet 'Ajrud (Horvat Teman) an Iron Age II religious site on the Judah-Sinai border, 327-340. Israel Exploration Society, Jerusalem.
3. Mienis, H.K., 2012. Chapter Twenty-One. The Faunal Remains. B. Shells. In A. Zertal (Ed.): El-Ahwat, a Fortified Site from the Early Iron Age near Nahal 'Iron, Israel, Excavations 1993-2000. Culture and History of the Ancient Near East, 24: 369-380. Brill, Leiden and Boston.
4. Mienis, H.K., 2012. Checklist of aquatic inland molluscs from Israel (Holocene – Recent). In D. Milstein, H.K. Mienis, and O. Rittner, 2012. [Field guide to the Molluscs of inland waters of the Land of Israel.], 45-49. Nature and Parks Authority, Jerusalem. [in Hebrew with Latin scientific names]
5. Mienis, H.K., 2012. Shells from the Cardo and the Nea Church. In O. Gutfeld (Ed.): Jewish Quarter Excavations in the Old City of Jerusalem conducted by Nahman Avigad, 1969-1982, Volume V: The Cardo (Area X) and the Nea Church (Areas D and T), Final Report: 475-478. Israel Exploration Society and Institute of Archaeology, Hebrew University of Jerusalem, Jerusalem.

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1. Safi, K., Meiri, S. and Jones, K.E. 2012. Body mass evolution in bats. In: *Body Size: linking pattern and process across space, time and taxonomic group* (eds. F. A. Smith and S. K. Lyons). University of Chicago Press, Chicago.

Books

1. Milstein, D., Mienis, H.K. and Rittner, O., 2012. Field guide to the inland water molluscs of the Land of Israel. 52 pp. Nature and Parks Authority, Jerusalem. (in Hebrew).
2. Tauzin, P. and Rittner, O. 2012. Cetoniinae of the Levant, chorological general survey. Le Coléoptèriste (supplement) 72pp.

Papers presented in scientific meetings

2011 Attractive toxic sugar baits (ATSB): Simple strategies to minimize adverse impacts on non-target organism. The American Mosquito control association. March 20-24, 2011 USA, (Müller G.C., Beier J.C., Traore S.F., Traore M.M., Doumbia S., Yefremova Z.A., Kravchenko V.D. and Schlein Y.)

2011 Biodiversity in the Eastern Mediterranean - An anthropogenic kaleidoscope. World Conference on Marine Biodiversity 26-30 September (Aberdeen, Scotland). (Goren M., Galil, B.S., Diamant, A. Yokes M.B.).

2011 The Tingidae (Hemiptera: Heteroptera) of Israel.. Poster presented in the 30th conference of the Entomological Society of Israel, Sede Boqer, 27 October, Abstract volume, p. 84. (Novoselsky, T., Freidberg, A.)

2011 The principal and performance of a novel contact trap for the control of *Anopheles gambiae* and nuisance mosquitoes in Africa. 77th Annual Meeting. The American Mosquito control association. March 20-24, , Abstracts USA. (Müller G.C., Traore S.F., Traore M.M., Doumbia S., Kravchenko V.D., Yefremova Z.A., Revay E.E., Beier J.C. and Schlein Y.)

2011 The Role of Morphological Integration in Ruminant Diversification. The Israeli Zoology Society 2011 (Haber, A.)

2011 28th annual meeting of the German Diptera Study Group, Breisach, Germany (Dorchin, N.).

2011 30th annual meeting of the Entomological Society of Israel, Sede Boqer, Israel (Dorchin, N.).

2011 7th International Congress of Systematic and Evolutionary Biology, Berlin, Germany (Dorchin, N.).

2011 A deeper view on a basal clade of linyphiid spiders: morphological phylogenetic analysis of the genus *Stemonyphantes* (Linyphiidae: Araneae). The 26th European Congress of Arachnology (ECA), Symposium: Challenges for arachnid systematics in the 21st century, Midreshet Ben-Gurion, Israel (Gavish-Regev, E., Hormiga G., and Scharff, N.).

2011 Alien and native fish assemblages in the warming eastern Mediterranean from a parasitological viewpoint the dual Taiwan-Israel research symposium on effects of human activities on marine environments. 12th-13th, December. Caesarea-Rothschild Institute University of Haifa (Diamant, A. Goren M., Galil, B.S.)

2011 Biogeography, diversity and conservation of the inland water fishes of Israel. Fish Remains Working Group (FRWG) 16th meeting. 23-30 October, Jerusalem, Israel (Goren, M.).

2011 Competition on food recourses between native and invasive species. The 48th Conference of the Zoological Society of Israel, Tel Aviv University. 25 December. (Gilad, R.L., Goren, M. Galil, B.S.).

2011 Novel species assemblages of alien and native fish and their parasites in a warming Mediterranean. World Conference on Marine Biodiversity 26-30 September 2011 (Aberdeen, Scotland). (Diamant, A. Goren M., Galil, B.S., Yokes M.B.).

2011 Phylogenetic Systematics and Molecular Dating, Department of Biology and NHMD, Copenhagen University, Denmark (2 weeks) (Gavish-Regev, E.).

2011 Planet Under Pressure 2012. London, UK (Gavrieli,Y.)

2011 The status of alien fish species along a depth gradient of Asdod. The 48th Conference of the Zoological Society of Israel, Tel Aviv University. 25 December. (Levit, Y., Goren, M. Galil, B.S.).

2012 Ascidian biodiversity (Phylum: *Chordata*, Class: *Ascidiacea*) along the coasts of Israel. Taxonomy, biodiversity, and beyond: Global change science and society in Israel (Shenkar N.).

2012 Detection and Molecular Characterization of 9000-year-old Mycobacterium tuberculosis from a Neolithic settlement in the Eastern Mediterranean. Tuberculosis Evolution "ICEP-2" Past and Present of Tuberculosis, Szeged, Hungary (I. Hershkovitz).

2012 Quantitative analyses of macrofauna and depositional environments of the Bira formation at Nahal Tavor. In L. Feldman and O. Dror (Eds.): Meeting of the Geological Society of Israel, Ashqelon 2012, Abstracts, 118. (Shaked-Gelband, D., Edelman-Furstenberg, Y., Mienis, H.K., Sandler, A., Zilberman, E., Stein, M. and Starinsky, A.).

2012 Record of *Bracon celer* (Hymenoptera: Braconidae) parasitoid of olive fruit fly in Israel. The Entomological Society of Israel (Kuslitzky, W. and Y. Argov).

2012 Study of parasitoids (Hymenoptera, Eulophidae) leaf mining fly *Chromatomyia horticola* (Goureau) (Diptera: Agromyzidae) to spontaneous grass vegetation in the Ulyanovsk province (Congress of Russian Entomologal Society, Petersburg, 2012 20-26 August). p. 153 (Yefremova Z.A., Strakhova I.S., Yegorenkova E.N., Kravchenko, V.D. A).

2012 Taxonomy, biodiversity and beyond: Global change science and society, Tel Aviv University, Israel (Shefer, S.).

2012 The macroevolutionary implications of morphological integration: the ruminant skull as a case study. Evolution 2012 (Haber, A.)

2012 The secret sponge garden. International workshop on: Taxonomy of Atlanto-Mediterranean deep sea sponges. Taxonomy of Atlanto-Mediterranean deep sea sponges, University of the Azores, Portugal **(**Shefer, S. Feldstein, T. Yahel, R. Huchon, D. and Ilan, M.).

2012 19th European Meeting of the Paleopathology Association, Lille, France (I. Hershkovitz).

2012 BARCODING of the marine biota along the Israeli Mediterranean coast. 9th Annual Congress of the Israel Association for Aquatic Sciences June 13-14, 2012. Jordan Valley College, Israel. (Paz, G. Duek, J. Galil, S.B. Alvaro, I., Rilov G. Goren., M. and Rinkewits B.).

2012 Developing an ecological model for fishery management of fishery in Lake Kinneret. 9th Annual Congress of the Israel Association for Aquatic Sciences June 13-14, 2012. Jordan Valley College, Israel. (Ofir, E. Gal, G. Shapiro, J and Goren M.).

2012 Systematics of the spider genus *Sintula* (Linyphiidae: Araneae) with notes on its diversity in Europe, North Africa and Israel. The 27th European Congress of Arachnology (ECA), Ljubljana, Slovenia, September 2012 (Gavish-Regev, E.).

2012 The value of a holy forest for Nature conservation: ants in a refuge. 5th Congress European Sections of the I.U.S.S.I., Montecatini Terme, Italy: p.119 (Martinez, J.-J. I., Amar, Z. & Ionescu-Hirsch, A.).

2012 To study parasitoids (Hymenoptera: Eulophidea) of *Yponemeuta malinellus* Zell. (Lepidoptera: Yponomeutiidae) in the Ulyanovsk province. P. 41-44 // Modern Zoological Researches in Russia and neighboring countries. Materials of the II International scientific-practical conference of memory of Professor M.A. Kozlov. P. 152. Cheboksary (Yegorenkova E.N., Yefremova, Z. A., A.V. Mitschenko, Strakhova I.S.).

2012 Using multiple factors to classify ant species in the bicolor group *Cataglyphis* sp. (Formicidae: Formicinae). Proceedings of the 31-th Conference of the Entomological Society of Israel 16 October 2012 (in Hebrew), p. 43 (Zeltser, R., Ionescu-Hirsch, A. & Hefetz, A.).

2012 Who are you *Garra rufa*? 9th Annual Congress of the Israel Association for Aquatic Sciences June 13-14, 2012. Jordan Valley College, Israel. (Kastin, D. Goren, M and Y. Tikochinski).

Graduate students

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

PhD students

2000- Reuvat Nitzan (T. Dayan and A. Ar)
Population dynamics of the chukar partridge in Israel.

2003 - Leon Novak (M. Ilan)
Engineering a bacterial expression system to produce large amounts of known and of modified naturally occurring bioactive compounds of pharmacological interest.

2004-2012 Shai Barkan (Y. Yom-Tov and A. Barnea).
Memory of resident and migratory birds.

2004-2012 Boaz Mayzel (M. Ilan)
Magnetoreception in sponges.

2004- Liat Gahanama (A. Freidberg)
A revision of the *Schistopterum* clade of Schistopterini.

2004- Constantin Grach (A. Freidberg)
Ecology and biology of costal dune insects.

2005-2011 Orit Skutelsky (T. Dayan and E. Feitelson)
Biodiversity conservation in biosphere reserves of Israel: the switch from a market led to conservation oriented agriculture

2005-2012 Yaron Krotman (M. Goren)
Fish biodiversity and ecology in oasis habitats in the Dead Sea Valley.

2005- Rachel Armoza (Y. Loya)

Ecological and physiological aspects of sex hormones in corals.

2005-2012 M. Haber (M. Ilan)
Biosynthesis and function of Natural products from sponge associated miscroorganisms.

2005- Irina Khalfin (M. Ilan)
Function of natural products from sponge associated fungi.

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

2006-2012 O. Hai (I. Hershkovitz)
Spinal evaluation in Lower Back Pain.

2006- Frida Belinky (D. Huchon and A. Lotem)
Multiple approaches to solve basal metazoan phylogeny and its implication on intron evolution.

2006- Yoni Vortman (A. Lotem)
Mate choice and multiple sexual signals in the Barn Swallow *H. r. transitive*.

2006- Chen Yoffe (Y. Benayahu)
Symbiont transmission in cnidarian hosts: integrated processes and mechanisms determine specificity.

2007-2011 Dror Zurel (Y. Benayahu and U. Gofna)
Lessapsian migrant species as vectors for dispersal of marine bacteria

2007-2012 Amir Shitenberg (D. Huchon and M. Ilan)
Phylogeny and evolution of demosponges.

2007-2012 G. Ibrahim (I. Hershkovitz)
Whiplash.

2007- Y. Aluma (M. Ilan)
Environment impact on sponge-fungi association.

2007- Emmanuelle Cohen-Shacham (T. Dayan)
Policies for managing ecosystem services

2007- Ronit Justo-Hanani (T. Dayan)
Legal and administrative aspects of genetically modified organisms in Israel.

2007- Aldona Kurzawska (D.E. Bar-Yosef Mayer and A. Marciniak)
Insight into Hunter-Gatherers' Life: The Role of Dentalium Shells in Late Epipalaeolithic Sites of the Levant.

2007- Ido Sella (Y. Benayahu)
Biomaterial from a soft coral

2007- Roee Segal (Y. Loya)
Toxicological effects of heavy metals on reef organisms.

2007- Maaya Weizel (Y. Loya)
Novel technology for establishment of totipotent tissues and "immortal" lines of a unique model system.

2008-2012 J. Abass (I. Hershkovitz)
Spinal stenosis

2008- Ada Alamaro (Y. Loya)
Evolutionary implications of sex change in fungiid corals
.

2008- Iris Bernstein (T. Dayan)
Landscape planning for ecological corridors and biodiversity conservation in peri-urban environments: The case of Modiin Forest Corridor.

2008- H. Cohen (I. Hershkovitz)
Fracture characteristics

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

2008- H. May (I. Hershkovitz)
Ancient DNA of Neolithic skeletons

2008- Noa Sokolover (M. Ilan)
Bryozoans ecology

2008- D. Stein (I. Hershkovitz)
3D-Reconstruction of the vertebral

2009- Omri Bronstein (Y. Loya)
Bioerosion of reef corals by sea urchins.

2009- Anat Feldman (S. Meiri)
Snake Macroecology. Tel Aviv University.

2009- Keren, R. (M. Ilan)
Acquisition of sponge-associated bacteria

2009- Ittai Renan (A. Freidberg)
To be determined.

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

2010- Anna Halaz (Y. Benayahu)
Phylogeny of octocorals, family Xeniidae.

2010- Liron Goren (F. Ben-Ami)
The evolutionary ecology of *Daphnia* and its microparasites in Israel.

2010- Nir Stern (Goren M.)
Systematic and phylogenic of the family Clupeidae (Pisces).

2009- Karin Tamar (S. Meiri)
Taxonomy and phylogeny of Israeli reptiles.

2010- T Tunis-Sella (I. Hershkovitz)
The chin.

2011- Itay Berger (T. Dayan).

2011- A. Lavi (M. Ilan)
Interactions within sponge microbial community.

2011- Roni Yizhar (F. Ben-Ami)
The evolution of virulence under conditions of frequent multiple infections.

2012- Elizabeth Morgulis (Dorchin, N.).
Phylogenetic classification of the genera Acanthiophilus Becker and Tephritomyia Hendel (Diptera: Tephritoidea: Tephritidae)

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.

MSc students

2004-2011 Daniel Yashunski (M. Goren)
Succession of fish community in planted corals in Elat.

2005- Kfir Gaier (M. Goren)
The impact of grazing fish on invertebrate communities in eastern Mediterranean.

2007-2011 Tamar Marcus (T. Dayan)
Spatial aspects of climate change and conservation.

2007- Thehila Nagar (M.Goren)
Feeding habits in some freshwater fishes in Israel.

2008-2011 Aviv Avisar (T. Dayan and U. Shanas)
Assessing the impact of visitor pressure in nature reserves.

2008-2012 Matan Ben Ari (D. Gerling)
Bionomics of the whitefly Dialeurolobus rhamni in the Judean hills.

2008-2011 Roni Lee (M.Goren)
Comparative study of reproductive aspects of invaders and native fish in Eastern Mediterranean.

2008-2011 Yahel Porat (T. Dayan and Y. Carmel)
Different land management practices and their impact on reptile communities.

2009-2012 Eran Amichai (Y. Yom-Tov and N. Kornfeld)
The biology of *Asellia tridens* in the Jordan Valley, Israel.

2009-2012 Daniel Berkowic (S. Meiri and S. Markman)
Egg size and body size changes in cuckoos and hosts in response to climate change.

2008- Hila Lahav (T. Dayan and A. Hefetz)
Ant communities under different land management practices.

2009-2012 Hadas Marshall (T. Dayan and Y. Mandelik)
Bee communities in the Arava Rift Valley.

2009-2012 Roee Maor (T. Dayan)
The phylogeny of activety patterns.

2009-2012 Elizabeth Morgulis (A. Freidberg)
The Ulidiidae (Diptera) of Israel

2009-2012 Ya'arit Levitt (M. Goren)
Invaders fish – native fish relationship along depth gradient in Eastern Mediterranean.

2009-2011 Ateret Shabtai (Y. Benayahu and G. Rilov)
Population dynamics of the invasive oyster *Spondylus spinosus* in the Israeli Mediterranean coast.

2009- Dolev Kastin (M. Goren)
reproductive and growing biology of the cyprinid fish Garra rufa.

2009- Natalie Shalev (Y. Benayahu and G. Rilov)
Development of benthic communities on a planned artificial reef at Eilat.

2009- Maya Spivak (S. Meiri and D. Huchon)
Phylogeny and Taxonomy of Israeli shrews.

2010-2012 Gal Eyal (Y. Loya)
Settlement and recruitment of scleractinian corals along a depth gradient (0-60 m).

2010- Ram Baranin (Y. Loya)
Legislation of Marine Protected Areas in Israel: Mediterranean and Red Sea Reproductive strategies of deep reef (60 m depth) corals.

2010- Levona Bodner (A. Freidberg)
The Tephritoidea (Diptera) of Israel

2010- Lital Dabool (S. Meiri)
Phylogeny Macroecology of reptile reproduction.

2010- Yael Dagan (F. Ben-Ami)
The evolution and maintenance of sexual reproduction in the Melanoides-trematodes model host-parasite system.

2010- Lee Eyal (Y. Loya)
Legislation of Marine Protected Areas in Israel: Mediterranean and Red Sea Reproductive strategies of deep reef (60 m depth) corals.

2010- Dana Genosar (T. Dayan)
The ecology and management of overabundant species.

2010- Yuval Itescu (S. Meiri)
Turtle Macroecology.

2010- Ariel Kedem (T. Dayan with N. Kronfeld-Schor)
Snake predation risk on spiny mice.

2010- Yael Mandelberg (Y. Benayahu)
Collagen producing octocorals of the genus Sarcophyton.

2010- Maria Novosolov (S. Meiri)
Macroecology of island reptiles.

2010- Shimon O. (M. Ilan)
Biotechnlogy of *Chondrosia reniformis* and *Chondrilla nucula*.

2010- Zohar Yanai (T. Dayan with A. Gasith)
Alien freshwater Mollusca in Israel - introduction pathways and biological traits.

2010- Yaniv M. (M. Ilan)
Ecology of *Chondrosia reniformis* and *Chondrilla nucula*.

2010- J. Peled-Levi (Y. Yom-Tov and T. Alon-Mozes)
Urban planning and wildlife.

2010- M. Rachamim (Y. Yom-Tov and A. Barnea)
Breeding biology of the great tit in urban and natural environment.

2010- Vivan Slone (I. Hershkovitz)
Vertebral hemangiomas.

2011-2012 Jassica Brukirer (M. Goren)
Some ecological aspects regarding the succession of biota on artificial substrate in the Mediterranean.

2011- Ofir Gilad (Y. Benayahu and R. Haj Ali)
Biomechanical properties of an octocoral collagen fibers

2011- Yonathan Guttel (F. Ben-Ami)
The maintenance of hybrid zones in a freshwater snail by parasitism.

2011- Amy Kadison (S. Meiri)
Reptile geographic ranges.

2011- Yehala Roterman (Y. Benayahu and U. Gofna)
Bacteria in invasive and indigenous bivalves.

2011- Schwartz, I. (M. Ilan)
Ecology and biotechnological application of the Red Sea sponge *Crella cyatopho.*

2011- Iris Wiseman (S. Meiri and Menachem Goren).
Overfishing in Israel.

2012- Jonatan Reberger (F. Ben-Ami)
Parasite-Mediated Determinants of Coexistence between Sexual and Asexual Host Snails

2012- Gilad Danon (Dorchin, N.).
Behavioral and ecological evidence for host associated differentiation in Dasineuriola sp. (Diptera: Cecidomyiidae).

2012- Farovich, Y. (M. Ilan)
Antimicrobial natural products from sponge-associated bacteria

2012- Idan Hayon (Dorchin, N.).
Taxonomy and biology of predatory gall midges (Diptera: Cecidomyiidae) on citrus mealybugs (Hemiptera: Pseudoccidae) in Israel.

2012- Idan, T. (M. Ilan)
Sponges and corals of the Mediterranean mesophotic reefs

2012- Naim, A. (M. Ilan Wageningen University)
Analysis of steady state cell proliferation and shedding in a selection of Red Sea sponges.

Post-doctoral fellows

2010-2011 Martin Grund

2010-2011 Ofir Levy

2010- Annat Haber

2011-2012 Corina S. Bazelet

2011-2012 Noa Shenkar

2011- Efrat Gavish Regev

2012 Jonathan Belmaker

2011- Roi Dor

2012- Rachel Sarig

2012 Inon Scharf

2012 - Jarkko Routtu

Fellowships and grants

Support for collections-based research is provided by fellowships and grants. Here we list the fellowships and grants of faculty members of Tel Aviv University who are affiliated with the collections. Needless to say, the many colleagues from other research institutions in Israel and abroad also receive fellowships and grants that hinge, at least in part, on work in the natural history collections. These data, however, are not available to us.

While these fellowships and grants and others cannot support collections maintenance, they are crucial for collection development since they provide the funds for active collecting, which are otherwise unavailable in the State of Israel. We do our best to help scientists use the collections and to promote collections-based biodiversity research.

2007-2011 Israel Science Foundation (ISF), Etiology of Black Band Disease (BBD) (Y. Loya and R. Rosenberg, TAU).

2007-2011 Mate choice and the evolution of phenotypic diversity: the unique sexual signals of the East Mediterranean Barn Swallow. The Israeli Academy of Science and Humanities (A. Lotem and R. Safran).

2008-2011 Israel Science Foundation (ISF). Energetic factors affecting seasonal migration , sexual segregation in free-tail bats. (Y. Yom-Tov and Kronfeld-Schor, N.).

2008-2011 Israel Science Foundation, with Drs. M. Kam, A. Degen and B. Krasnov ($175,000) (E. Geffen).

2008-2011 Israel-Italy R&D project. The impacts of biological invasions and climate change on the biodiversity of the Mediterranean Sea (Goren, M. and Galil, B.).

2008-2011 The Israel Academy of Sciences and Humanities, centers of Excellence. Climate changes on the environment and human society in the upper Jordan Valley. (Y. Yom-Tov).

2009- SYNTHESYS grant, Museum für Naturkunde, Berlin (S. Meiri with S. Markman)

2009- SYNTHESYS grant, University of Copenhagen (S. Meiri with S. Markman); 4000€

2009-2011 GLOWA Jordan River research grant. Modeling the impact of global climate change on terrestrial biodiversity in the Jordan River Basin: Testing planning scenarios and climate change scenarios (3 year grant; *ca.* EURO 84,000 total) (T. Dayan P.I. of subproject)

2009-2011 Grantor IITA; topic Novel Strategies for Managing Whiteflies on Cassava; duration: 2 years, 25.000$ (D. Gerling).

2009-2012 EU project (Technology Enchanced Learning), DynaLearn: Engaging and informed tools for learning conceptual system knowledge (Benayahu Y. with collaborators EURO 3,193,495.00).

2009-2012 Israel Science Foundation research grant. The evolution of activity patterns of mammals: a macroecological and macroevolutionary perspective (3 year grant; ca. $ 40,000 per annum) (T. Dayan).

2009-2013 Hydrodynamics of contact of larvae with substrate (Benayahu Y. with G. Zilman, Faculty of Engineering, TAU, NIS 594,000)

2009-2013 Israel Science Foundation, with M. Kam ($240,000) (E. Geffen).

2009-2013 United States-Israel Binational Science Foundation (BSF). Research project: Phylogeny of the octocorals (phylum Cnidaria), family Xeniidae: Application of molecular and morphology based approaches (Benayahu Y. with C. McFadden, Harvey Mudd College, Claremont, CA and R. Toonen, University of Hawaii, $ 160,000).

2010- IRG: International reintegration grant, FP7 framework – €100,000. Funding period: 48 months (Holzman, R.).

2010 -2012 Examining the impact of fisheries management on the Lake Kinneret ecosystem by developing and applying a fisheries based model. (Goren, M with G. Gal - Israel Oceanographic and Limnological Research institute). - Israel Water Authority.

2010- Israel Taxonomic Initiative grant for a PhD scholarship in reptile taxonomy (S. Meiri with Karin Tamar).

2010- John S. Latsis Public Benefit Foundation grant, (S. Meiri with Panayiotis Pafilis and Efstratios Valakos); 8000€

2010-2011 Iarel Taxonomy Initiative. Survey of parasites of freshwater snails (19,000$) (F. Ben-Ami and M. Ucko)

2010-2012 High Council for Scientific and Technological Cooperation between France-Israel, Research Networks Program in Water Science, Resource Management. ("The relationship between ecosystem management and the provision of ecosystem services in wetlands: a comparison between the Hula (Israel) and Camargue (France)") (2 year grant; ca. $ 40,000 per annum) (T. Dayan and. P. Grillas).

2010-2013 ODEMM – Options for Ecosystem-based Marine Management - EU7 (Goren, M.).

2010-2013 European FP7 Cooperation Work Programme: Food, Agriculture and Fisheries, and Biotechnology (Brussels, Belgium) (Ilan, M.).

2010-2013 ISF - Israel Science Foundation, Analysis of four nuclear and mitochondrial myxozoan genomes, NIS 234,000 (D. Huchon (P.I.).

2011 Dan David Foundation: Bones tell a tale of yore (I. Hershkovitz).

2011 Dan David Foundation: Manot Cave (I. Hershkovitz).

2011 Dan David Foundation: Qesem cave project (I. Hershkovitz).

2011- Israel Taxonomic Initiative grant for a taxonomic survey of the Tephritoidea (Diptera) of Israel (A. Freidberg with E. Morgulis)

2011- Israel Taxonomic Initiative grant for taxonomy course with a foreign expert (S. Meiri with Lee Grismer)

2011 Israeli Taxonomy Initiative (ITI) grant for taxonomic surveys. $7,705 (Dorchin, N.).

2011 Krill Prize for Excellence in Scientific Research (Wolf Foundation) (S. Meiri).

2011 Lynn Schusterman, Madlyn and Len Abramson, and Carol and Joe Reich, given in honor of Michael Steinhardt's birthday. (P.I.) 28,000$ (97,440 NIS) (Gavrieli,Y.).

2011 Ministry of Justice: Department of the Public Trustee and the Official Receiver (P.I.). For science for all publications on the internet. (150,000 NIS ca. $40,000) (Gavrieli,Y.).

2011- SYNTHESIS grant, Natural History Museum, London (S. Meiri with S. Markman); 4000€

2011 Yad Hanadiv "when Science meets Nature" Workshop Grant (PI), 27000$) (S. Meiri).

2011, Carlsberg Foundation research grant (Carlsbergfondet), Denmark, 220,550DKK (~$40,000) (Gavish-Regev, E.).

2011-2012 Iarel Taxonomy Initiative (M. Ilan)

2011-2012 The Nature and Parks Authority, Israel, ($25,000) (Geffen, E . and Gafny, S.)

2011-2012: Israel Science Foundation equipment grant. 3-D PIV system for measuring biological flows. $103,000. Funding period: 12 months (Holzman, R.).

2011-2013 Israel - Italy Science Cooperation (Ilan, M.).

2011-2013 The Rothschild Foundation (Ilan, M., N. Kronfeld-Schor, S. Meiri and A. Ayali).

2011-2015: Israel Science Foundation. Suction feeding at low Reynolds numbers: Hydrodynamic and biomechanic constraints on larval fishes feeding. 288,000 NIS/Year. Funding period: 48 months (Holzman, R.).

2012 Showder Foundation: annulus fibrosus macro and micro-structure (I. Hershkovitz).

2012 Dan David Foundation: Bones tell a tale of yore (I. Hershkovitz).

2012 Dan David Foundation: Manot Cave (I. Hershkovitz).

2012 Dan David Foundation: Qesem cave project (I. Hershkovitz).

2012- Israel Science Foundation grant, "Is evolution on islands special?" (PI, 200,000$) (S. Meiri).

2012 Israeli Taxonomy Initiative (ITI) grant for taxonomic surveys. $8,000 (Dorchin, N.).

2012 Ministry of Justice: Department of the Public Trustee and the Official Receiver (P.I.). For science for all publications on the internet. (75,000 NIS ca. $19,000) (Gavrieli,Y.).

2012-2013 Israel Science Foundation (Ilan, M.).

2012-2015 From Genetic Diversity to Cormorants - toward a sustainable fish management in Lake Kinneret. WP5 – The reproduction of cichlid fishes in the lake. - Ministry of Agriculture (Goren,M.).

2012-2015 Israeli Ministry of Environmental Protection. First assessment of biological diversity of the larval pool of reef fishes in the northern gulf of Eilat as a baseline for assessing environmental perturbations. Co-PI: Moshe Kiflawi (BGU). 50,000 NIS/Year. Funding period: 36 months (Holzman, R.).

Visiting scientists at the National Collections

The attached list includes visitors from institutions **other than** Tel Aviv University who came personally to use the natural history collections of Tel Aviv University in the past academic year. Much use is made of the collections by additional scientists who did not visit them in person. Some scientists get identification services for their research projects and others have 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 for researchers in their home institutions.

Date	Name	Institute	Country	Taxonomic group
2011 Oct	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2011 Oct	O. Valensi	Israel Nature and Parks Authority	Israel	Molluscs
2011 Oct	N. Leader	Israel Nature and Parks Authority	Israel	Molluscs
2011 Oct	Y. Ben-Dov	Volcani Center	Israel	Entomology
2011 Oct	M. Spodek	Volcani Center	Israel	Entomology
2011 Oct	N. Vikhrev	Zoological Museum, Moscow	Russia	Entomology
2011 Oct	H. Shirihai		Israel	Birds
2011 Oct	A. Bar		Israel	Reptilia
2011 Oct	G. Haimovitch		Israel	Reptilia
2011 Oct	C. Van Sickle	University of Michigan	USA	Anthropology
2011 Nov	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2011 Nov	M. San-Roman		Israel	Birds
2011 Nov	L. Sapir-Chen	Tel Aviv University	Israel	Mammals
2011 Nov	S. Nemtzuv	Israel Nature and Parks Authority	Israel	Mammals
2011 Nov	A. Klinman	Tel Aviv University	Israel	Mammals

Date	Name	Institute	Country	Taxonomic group
2011 Nov	Z. Arad	Technion	Israel	Mammals & Birds
2011 Nov	E. Hadad	Israel Nature and Parks Authority	Israel	Mammals
2011Nov–2011 Dec	S. Müller	Leuphana Universität	Germany	Entomology
2011Nov–2011 Dec	A.K. von Dein	Leuphana Universität	Germany	Entomology
2011Nov–2011 Dec	C. Bliesch	Leuphana Universität	Germany	Entomology
2011Nov–2011 Dec	C. Drees	Leuphana Universität	Germany	Entomology
2011 Dec	I. Harry	Leuphana Universität	Germany	Entomology
2011 Dec	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2011 Dec	E. Gilat	Biological Institute	Israel	Birds
2011 Dec	D. Kent		Israel	Mammals
2012 Jan	R. Gabai	Ben Gurion University	Israel	Birds
2012 Jan	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2012 Jan	D. Kent		Israel	Mammals
2012 Jan	E. Gilat	Biological Institute	Israel	Birds
2012 Jan	Y. Deks		Israel	Mammals & Birds
2012 Jan	I. Oren		Israel	Mammals & Birds
2012 Jan	A. Klinman	Tel Aviv University	Israel	Mammals
2012 Feb	R. Kehati		Israel	Archaeo-Malacology
2012 Feb	A. Klinman	Tel Aviv University	Israel	Mammals
2012 Feb	B. Korotyaev	Laboratory of the Insect systematics, ZIN RAS, St. Petersburg	Russia	Entomology

Date	Name	Institute	Country	Taxonomic group
2012 Feb	M. Sade		Israel	Mammals
2012 Feb	Y. Tzuberi	Bar Ilan	Israel	Archaeo-Malacology
2012 Feb	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2012 Mar	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2012 Mar	A. Klinman	Tel Aviv University	Israel	Mammals
2012 Mar	M. Fridman		Israel	Mammals & Birds
2012 Mar	E. Gilat	Biological Institute	Israel	Birds
2012 Mar	G. Ribak	Technion	Ísrael	Entomology
2012 Mar	S. Reingold	Technion	Ísrael	Entomology
2012 Mar	M.A. Bologna	Universita Roma Tre	Italy	Entomology
2012 Mar	A. Payne	Universita Roma Tre	Italy	Entomology
2012 Mar-2012 Apr	J. Ascher	Universita Roma Tre	Italy	Entomology
2012 Apr	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2012 Apr	H.H. Waintrub	Museum of Prehistory, Firenza	Italy	Collections, Campus Teva
2012 Apr	H. Shirihai		Israel	Birds
2012 Apr	L.A.A. Janssens	Prague University	Czech Republic	Mammals
2012 Apr	I. Van Hors'ctz	Prague University	Germany	Mammals
2012 Apr	H. Defaepe	Prague University	Czech Republic	Mammals & Birds
2012 Apr	Y.G. Arzanov	South Scientific Center	Russia	Entomology
2012 Apr	M. Mei	Università degli Studi di Roma "La Sapienza"	Italy	Entomology
2012 Apr	P. Cerretti	Università degli Studi di Roma "La Sapienza"	Italy	Entomology
2012 May	T. Smit	Nederlands Centrum voor Biodiversiteit - . naturalis, Leiden	Netherlands	Entomology

Date	Name	Institute	Country	Taxonomic group
2012 May	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2012 May	E. Shefer	Israel Oceanographic and Limnological Research	Israel	Molluscs
2012 May	Y Goldman	Israely Air Force	Israel	Molluscs
2012 May	J. Heraty	University of California, Riverside	USA	Entomology
2012 May	A. Slizewski	Eberhard Karls Universität Tübingen	Germany	Anthropology
2012 May	C. Van Sickle	University of Michigan	USA	Anthropology
2012 Jun	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2011 Jun	O. Almog	Israel Oceanographic and Limnological Research	Israel	Molluscs
2011 Jun	A. Israel	Israel Oceanographic and Limnological Research	Israel	Molluscs
2012 Jun	Y. Tzuberi	Bar Ilan	Israel	Archaeo-Malacology
2012 Jun	S. Martinez	Haifa University	Israel	Archaeo-Malacology
2012 Jun	M. Penes	Tel Aviv University	Israel	Mammals
2012 Jun	O. Vinkler		Israel	Mammals & Birds
2012 Jun	M. Niehuis	Univ. Koblenz-Landay	Germany	Entomology
2012 Jun	J. Buse	Univ. Koblenz-Landay	Germany	Entomology
2012 Jun	O. Niehuis	Zoological Research Museum Alexander Koenig, Bonn	Germany	Entomology
2012 Jun	A. Berman	Ben Gurion University	Israel	Entomology
2012 Jun	S. Lacy	Washington University in Saint Louis	USA	Anthropology
2012 Jun	A. Slizewski	Eberhard Karls Universität Tübingen	Germany	Anthropology
2012 July	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2012 July	N. Bitler	University of Chicago	USA	Molluscs

Date	Name	Institute	Country	Taxonomic group
2012 July	S. Landu	Israel Nature and Parks Authority	Israel	Mammals & Birds
2012 July	E. Gilat	Biological Institute	Israel	Birds
2012 July	A. Norrbom	Systematic Entomology Lab., USDA Washington	USA	Entomology
2012 July	A. Slizewski	Eberhard Karls Universität Tübingen	Germany	Anthropology
2012 July	O. Pearson	University of New-Mexico	USA	Anthropology
2012 Aug	S. Avnaim-Katav	Haifa University	Israel	Molluscs
2012 Aug	A. Slizewski	Eberhard Karls Universität Tübingen	Germany	Anthropology
2012 Sep	TAU Music	Tel Aviv University	Israel	Wet Collections
2012 Sep	M. Blecher	Israel Nature and Parks Authority	Israel	Entomology
2012 Sep	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2012 Sep	Y. Charka		Israel	Mammals & Birds
2012 Sep	A. Slizewski	Eberhard Karls Universität Tübingen	Germany	Anthropology
2012 Sep	I. Blecher	Israel Nature and Parks Authority	Israel	Entomology
2012 Sep	M. Marini	Universita di Bologna	Italy	Entomology

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 courses, several of which are our compulsory first and second year courses, taught to hundreds of students; 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 Avese (academic course)	Y. Yom-Tov and E. Geffen	Tel Aviv University	Birds, Taxidermist and Museum Class
Insects the Flagship of Biodiversity (academic course)	A. Freidberg, Corchin, N. and D. Simon	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
Faunistics (academic course)	Z. Arad	Technion	Birds, Mammals and Museum Class
Faunistica (academic course)		Open University	Birds, Mammals and Museum Class
Introduction to Animal Kingdom: Invertebrates and Vertebrates (academic course)	A. Abelson and S. Meiri	Tel Aviv University	Mammals

Purpose	Name	Institute	Taxonomic group
Introduction to Archaeozoology	L. Sapir Chen	Tel Aviv University	Mammals
Archaeozoology workshop	L. Sapir Chen	Tel Aviv University	Mammals, Fish and Museum Class
Vertebrates Anatomy (academic course)	D. Eilam, M. Ovadia and U. Oron	Tel Aviv University	Reptilia, Mammals and Taxidermist
Animal Behavior	I. Golani	Tel Aviv University	Mammals and Museum Class
The Invertebrates: Comparative Functional Biology (academic course)	M. Ilan, Y. Benayahu and A. Abelson	Tel Aviv University	Invertebrates, Entomology and Histology
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
Ichthyology (academic course)	M. Goren	Tel Aviv University	Fishes and Museum Class
Trips in the experimental zoo & Natural History Museum (academic course)	T. Dayan	Tel Aviv University	Birds, Mammals and Reptilia
Biology and Systematic of Marine Invertebrates: (academic course)	Y. Benayahu	Interuniversity Institute for Marine Sciences	Invertebrates
Bird-Watching		Israeli Air Force	Birds and Museum Class
Bird-Watching	T. Shariv	Avshalom Institute	Birds and Museum Class

Purpose	Name	Institute	Taxonomic group
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

Support for various individuals and organizations

The TAU natural history collections function as a national collection, by providing services to the scientific committee, as well as to other organizations and, to the best of our abilities under currently constrained conditions, also to the general public. Here we list **a sample** of the services provided by the collections in the past academic year. We apologize that the list is not full, but in the current conditions of under-staffing we are unable to dedicate the human-power 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	Haifa port	Ministry of Agriculture and rural development	Arachnidae
Taxonomy Identification	Ashdod port	Ministry of Agriculture and rural development	Arachnidae
Taxonomy Identification	Dr. Uri Shalom, Dr. Abed Sirati, Dan Ish Shalom, Tamar Yeger	Ministry of Environmental protection	Arachnidae
Taxonomy Identification	Yedidia Bentur MD	RAMBAM Health Care Campus, Department of Toxicology	Arachnidae
Taxonomy Identification	Z. Sever		Arachnidae
Taxonomy Identification	U. Shanas	Oranim	Arachnidae
Taxonomy Identification	F. Ben Ami	Tel Aviv University	Molluscs

Purpose	Name	Institute	Taxonomic group
Taxonomy Identification	E. van dan Brink	Israel Antiquity Authority	Molluscs
Taxonomy Identification	E. Galili	Israel Antiquity Authority	Molluscs
Taxonomy Identification	S. Vaisman	Plant Protection and Inspection Services	Molluscs
Taxonomy Identification	E. Sheffer	IOLR - Haifa	Molluscs
Taxonomy Identification	A. Israel	IOLR - Haifa	Molluscs
Taxonomy Identification	A. Israel	IOLR - Haifa	Molluscs
Taxonomy Identification	D. Milstein	Israel Nature and Parks Authority	Molluscs
Taxonomy Identification	North Distric	Israel Nature and Parks Authority	Molluscs
Taxonomy Identification	G. Rilov	IOLR - Haifa	Spong
Taxonomy Identification	A. Israel	IOLR - Haifa	Spong
Taxonomy Identification	R. Yahel	Israel Nature and Parks Authority	Spong
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
Taxonomy Identification	H. Verkoles	Israel	Fossil
Taxidermist services	Nature Campus	Tel Aviv University	Mammals, Birds and Taxidermist
Taxidermist services		Israel Nature and Parks Authority	Birds and Taxidermist
Taxidermist services		Safari, The Zoological Center Tel Aviv - Ramat Gan	Mammals and Taxidermist
DNA Shipment	S. Goldberg	Whittier College, USA	Reptilia

Purpose	Name	Institute	Taxonomic group
DNA Shipment	H. Lerp	Institut für Ökologie, Evolution und Diversität, Germany	Mammals
DNA Shipment	M.T. Clementz	University of Wyoming, USA	Mammals
DNA Shipment	M. Vergara	University of the Basque Country, Spain	Mammals
DNA Shipment	A. Centeno-Cuadros	Hebrew University	Mammals
DNA Shipment	H. Lerp	University of Frankfurt, Germany	Mammals
Electronic Data	D. Milstein	Israel Nature and Parks Authority	Molluscs and Fish
Electronic Data	I. Sinai	Israel Nature and Parks Authority	Amphibian
Electronic Data	Z. Olynic	Israel Nature and Parks Authority	Mammals, Reptilia and Birds
Electronic Data	E. Vidan	Israel Nature and Parks Authority	Mammals, Reptilia and Birds
Electronic Data	N. Leader	Israel Nature and Parks Authority	Mammals and Birds
Electronic Data	A. Terkel	Safari	Mammals, Reptilia and Birds
Electronic Data	A. Bauer	Augustinian university located in Villanova, USA	Reptilia
Electronic Data	G. Perry	Texas Tech University, USA	Reptilia
Electronic Data	B. Shacham	Hebrew University	Reptilia
Electronic Data	D. Pincheira-Donoso	University of Exeter, UK	Reptilia
Electronic Data	S. Goldberg	Whittier College, USA	Reptilia

Purpose	Name	Institute	Taxonomic group
Electronic Data	S. Carranza	Institute of Evolutionary Biology, Spain	Reptilia
Electronic Data	N. Carretero	Universidade do Porto, Portugal	Reptilia
Electronic Data	I. Skourtanioti	Greece	Reptilia
Electronic Data	P. Wagner	Koenig Museum, Germany	Reptilia
Electronic Data	G. Shenbrot	Ben Gurion University	Mammals
Electronic Data	A. Centeno-Cuadros	Hebrew University	Mammals
Electronic Data	M. Vergara	University of the Basque Country, Spain	Mammals
Electronic Data	I. Khorozyan	Universität Göttingen, Armenia	Mammals
Electronic Data	M.T. Clementz	University of Wyoming, USA	Mammals
Electronic Data	F. Houssaye	Cerza Conservation, France	Mammals
Electronic Data	L. Maul	Senckenberg, Germany	Mammals
Electronic Data	L. Kolska	Hebrew University	Mammals
Electronic Data	M. Calero	Natural History Museum of Crete	Birds
Electronic Data	A. Shirihai		Birds
Electronic Data	F. Monti	Italy	Birds
Electronic Data	O. Ovadia	Ben Gurion University	Birds
Electronic Data	D. Furth	Smithsonian Institute, USA	Entomology
Electronic Data	S. Barinova	Haifa University	Lichen
Shipment of Specimens	S. Goldberg	Whittier College, USA	Reptilia
Shipment of Specimens	M. Rozenfeld	Alon High school, Ramat HaSharon	Mammals
Shipment of Specimens	S. Rotich	Hebrew University	Birds

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	A. Armani	Department of Animal Pathology, Prophylaxis and Food Hygiene, Italy	Fishes
Shipment of Specimens	J. Williams	Smithsonian Instirute, USA	Fishes
Shipment of Specimens	B. Russell	Curator Emeritus of Fishes, Museum & Art Gallery of the Northern Territory, Australia	Fishes
Shipment of Specimens	A. Zitek	Dept. of Chemistry, Division of Analytical Chemistry, VIRIS Laboratory - Biological Migration Studies, Austria	Molluscs
Shipment of Specimens	A. Andouche	Museum National d'Histoire Naturelle, France	Invertebrates: Soft Corals
Shipment of Specimens	C. Lueter	Leibniz-Institut fuer Evolutions- und Biodiversitaetsforschung, Germany	Invertebrates: Soft Corals
Shipment of Specimens	C.S. McFadden	Harvey Mudd College, USA	Invertebrates: Soft Corals
Shipment of Specimens	M.T. Tøttrup	Zoological Museum, Natural History Museum of Denmark, Denmark	Invertebrates: Soft Corals
Shipment of Specimens	L. van Ofwegen	National Museum of Natural History , Leiden The Netherlands	Invertebrates: Soft Corals
Shipment of Specimens	R. Toonen and B. Bowen	The Hawai‘i Institute of Marine Biology, USA	Invertebrates: Soft Corals
Shipment of Specimens	E.L. Hirose	Fac. Sci., Univ. Ryukyus, Japan	Invertebrates: Ascidians
Shipment of Specimens	R. Brunetti	Via Foscolo, 14. 35030 Selvazzano (PD), Italy	Invertebrates: Ascidians

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	X. Turon	Center for Advanced Studies of Blanes, Spain	Invertebrates: Ascidians
Shipment of Specimens	P.E. Cushing	Denver Museum of Nature and Science, USA	Arachnida
Shipment of Specimens	B.A. Huber	Zoological Research Museum Alexander Koenig, Bonn, Germany	Arachnida
Shipment of Specimens	H. Arıkan	Fen Fakültesi Biyoloji Bölümü Bornova/İzmir, Turkey	Arachnida
Shipment of Specimens	E. Mora	Universitat de Barcelona, Spain	Arachnida
Shipment of Specimens	M.A. Arnedo	Universitat de Barcelona, Spain	Arachnida
Shipment of Specimens	M. Kuhlmann	The Natural History Museum, London UK	Entomology
Shipment of Specimens	K.J. David	National Bureau of Agriculturally Important Insects, Bengaluru Karnataka, India	Entomology
Shipment of Specimens	K. S. Nicolaus	Copernicus University, Poland	Entomology
Shipment of Specimens	B. Garner	The Natural History Museum, UK	Entomology
Shipment of Specimens	J. Noyes	The Natural History Museum, UK	Entomology
Shipment of Specimens	J.C. Deeming	National Museum of Wales, UK	Entomology
Shipment of Specimens	P. Jäger	Frankfurt, Germany	Entomology
Shipment of Specimens	M. Niehuis	Zoological Research Museum Alexander Koenig, Bonn, Germany	Entomology
Shipment of Specimens	F. Mason	Centro Nazionale Biodiversità Forestale "Bosco Fontana" Sede di Verona, Italy	Entomology

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	M. Bologna	Universita Roma Tre, Italy	Entomology
Shipment of Specimens	A. Tinaut	Universidad de Granada, Spain	Entomology
Shipment of Specimens	M.D. Zerova	Schmalhausen Institute of Zoology, Ukraine	Entomology
Shipment of Specimens	C. Kehlmaier	Dresden Museum of Zoology, Germany	Entomology
Shipment of Specimens	E. Krzeminska	Polish Academy of Sciences, Poland	Entomology
Shipment of Specimens	G. Wagner	Hamburg, Germany	Entomology
Shipment of Specimens	K.M. Harris	Ripley, Woking, Surrey, UK	Entomology
Shipment of Specimens	T. Griswold	Bee Biology & Systematics Laboratory Utah State University Logan, USA	Entomology
Shipment of Specimens	M. Jaschhof	Greifswald, Germany	Entomology
Shipment of Specimens	K. Horstmann	Lehrstuhl Zoologie III, Biozentrum, Germany	Entomology
Shipment of Specimens	J.L. Reyes-Lopez	Universidad de Cordoba, Spain	Entomology
Shipment of Specimens	H. Schnee	Markkleeberg, Germany	Entomology
Shipment of Specimens	B. Pauly	Zoological Institute RAS, St. Petersburg, Russia	Entomology
Shipment of Specimens	K. Mikhailov	Zoological Museum of the Moscow State University, Russia	Entomology
Shipment of Specimens	G.A. Evans	USDA, Beltsville, MD, USA	Entomology
Shipment of Specimens	J. Papp	Natural History Museum, Budapest, Hungary	Entomology
Shipment of Specimens	Y.M. Marusik	Museum, University of Turku, Finland	Entomology

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	P.J. Schwarz	University of California, Irvine, CA, USA	Entomology
Shipment of Specimens	T. Assmann	University of Lueneburg, Germany	Entomology
Shipment of Specimens	B. Korotyaev	Zoological Institute RAS, St.Petersburg, Russia	Entomology
Shipment of Specimens	V.B. Golub	Voronezh State University, Russia	Entomology
Shipment of Specimens	Z. Efremova	Ulyanovsk State Pedagogical University, Russia	Entomology
Shipment of Specimens	A. Dorchin	Institute of Evolution, Haifa University, Israel	Entomology
Shipment of Specimens	A.Z. Lehrer	Israel	Entomology
Shipment of Specimens	A. Kotenko	The I. I. Schmalhausen Institute of Zoology, Kiev, Ukraine	Entomology
Shipment of Specimens	T. Ho	Koeln, Germany	Entomology
Shipment of Specimens	E. Figueiredo	Universidade Tecnica de Lisboa, Portugal	Entomology
Shipment of Specimens	M.M. Kovblyuk	University of Turku, Finland	Entomology
Shipment of Specimens	S. Patiny	Gembloux Belgique	Entomology
Shipment of Specimens	D. Michez	Montferrier-sur-Lez France	Entomology
Shipment of Specimens	D. Furth	Smithsonian Institution Washington, USA	Entomology
Shipment of Specimens	Y. Ben-Dov	Volcani Center, Israel	Entomology
Shipment of Specimens	E. Scheuchl	Vlden, Germany	Entomology
Shipment of Specimens	M. Lillig	Germany	Entomology
Shipment of Specimens	S. Risch	Leverkusen, Germany	Entomology
Shipment of Specimens	H. Dathe	Deutsches Entomologisches Institut, Germany	Entomology

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	M. Werner	Thun, Switzerland	Entomology
Shipment of Specimens	A. Müller	Entomological Collection, Switzerland	Entomology
Shipment of Specimens	E. Colonnelli	Rome, Italy	Entomology
Shipment of Specimens	P. Cerretti	Università degli Studi di Roma "La Sapienza", Italy	Entomology
Shipment of Specimens	D.V. Logunov	The University of Manchester, Manchester UK	Entomology
Shipment of Specimens	K. Rognes	University of Stavanger Norway	Entomology
Shipment of Specimens	X.L. Chen	Chinese Academy of Sciences, China	Entomology
Shipment of Specimens	A.P. Gary	Canadian National Collection of Insects, Canada	Entomology
Shipment of Specimens	N. Vikhrev	Zoological Museum, Moscow, Russia	Entomology
Shipment of Specimens	M. Nabozhenko	Southern Scientific Centre, Russia	Entomology
Shipment of Specimens	Y.G. Arzanov	Southern Scientific Centre, Russia	Entomology
Shipment of Specimens	N. Yunakov	ZIN RAS, St.Petersburg Russia	Entomology
Shipment of Specimens	J.T. Smit	Nederlands Centrum voor Biodiversiteit, The Netherlands	Entomology
Shipment of Specimens	M. Barták	Czech University of Agriculture, Czech Republic	Entomology
Shipment of Specimens	J. Bezdek	Mendel University, Czech Republic	Entomology
Shipment of Specimens	X. Espadaler	Universitat Autònoma de Barcelona, Spain	Entomology

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	C. Georgiadis	University of Athens, Greece	Entomology
Shipment of Specimens	D. Burckhardt	Naturhistorisches Museum, Switzerland	Entomology
Shipment of Specimens	M. Moosburg	Munchen, Germany	Entomology
Shipment of Specimens	C. Drees	Universität Lüneburg, Germany	Entomology
Shipment of Specimens	P.J. Attewell	Herts, UK	Entomology
Shipment of Specimens	O. Pekarsky	Budapest, Hungary	Entomology
Shipment of Specimens	M. Mei	Università degli Studi di Roma "La Sapienza", Italy	Entomology
Shipment of Specimens	T. Deuve	Muséum national d'Histoire naturelle, France	Entomology
Shipment of Specimens	B. Fisher	California Academy of Sciences, USA	Entomology

Collections budget

הוצאות שכר

	מספר משרות	סך העלות
סה"כ אוצרים	17.20	**4,560,289**
אוצרים (1)	3.50	1,959,448
אוצרים - עמיתי מחקר	2	990,848
אוצרים בגמלאות	7	0
מדענים עולים	3.5	943,701
אוצרים נלווים (2)	1.2	666,292
סגל טכני (4)	15.46	**4,424,686**
סה"כ הוצאות שכר	33.38	**8,984,975**

מלגות

מלגות פוסט דוק	263,729
סה"כ מלגות	**263,729**

הוצאות שאינן שכר

הוצאות אחסון	110,203
הוצאות שימור	115,695
הוצאות תיעוד וקטלוג	92,632
הוצאות לשיפור מצב האוספים (3)	59,474
סה"כ הוצאות שאינן שכר	**378,003**

סה"כ הוצאות לפני הוצאות מנהל ומשק	**9,626,707**

הוצאות מנהל ומשק (20%)	**1,925,341**

סה"כ הוצאות	**11,552,048**

מקורות מימון

השתתפות ות"ת:	**2,017,784**
השתתפות ות"ת - קמ"ע	176,784
השתתפות ות"ת	1,841,000
השתתפות מוסד:	**8,182,823**
השתתפות המוסד בהוצאות שכר האוצרים	2,475,845
השתתפות המוסד בהוצאות שכר הסגל הטכני	3,139,904
השתתפות המוסד בהוצאות שאינן שכר	641,732
השתתפות המוסד - הוצאות כלליות	1,925,341
הכנסות מגופים ציבוריים :	**1,351,441**
מענקי מחקר	1,284,781
משרד הקליטה	66,660

סה"כ הכנסות	**11,552,048**

עודף (גרעון)	**0**

(1)שכר האוצרים מהווה 50% ממשרתם של אנשי הסגל הבכיר הפעילים במוסד ושהנם בעלי אחריות ישירה על אוספים ספציפיים.

(2)שכר האוצרים הנילווים מהווה 20% ממשרתם של הפעילים במוסד .

(3)הוצאות לשיפור מצב האוספים כוללות השלמת אוספים וטיפול במערך האיחסון.

(4)לא כולל הוצאות והכנסות בגין קמפוס טבע

לא נלקחה בחישוב הוצאה בסך כ-6M$ הנדרשת למחשוב אוסף אנטומולוגי והעלאת קואורדינטות על נתוני אוספים.

תקציב מתוכנן של מרכז הידע התשתיתי לתקופה 1.12.2010-30.11.2011

דו"ח כספי מפורט ישלח על ידי האוניברסיטה אחרי ה 30.11.2011.

הוצאות משכורת	128,000
רכישת ציוד מדעי	20,000
רכישת חומרים	30,000
תשלומים שונים	39,400
הוצאות מינהל ומשק-תקורה	32,600
סה"כ	250,000

International Scientific Advisory Board

Vicki Buchsbaum, Pearse Institute of Marine Sciences, University of California, Santa Cruz, USA

Gretchen C. Daily, Department of Biology, stanford University, Stanford, CA, USA

Jared Diamond, Department of Physiology, University of California, Los Angeles Medical School, Los Angeles, CA, USA

Paul Ehrlich, Department of Biological Sciences, Stanford University, Stanford, CA, USA

Daphne G. Fautin, Ecology and Evolutionary Biology, Invertebrate Zoology University of Kansas, USA

Marcus W. Feldman, Department of Biology, stanford University, Stanford, CA, USA

Lord Robet May of Oxford OM AC Kt FRS, Department of Zoology, Oxford University, Oxford, UK

Harold A. Mooney, Department of Biological Sciences, Stanford University, Stanford, CA, USA

Peter Raven, Missouri Botanical Garden, St. Louis, MO, USA

Daniel Simberloff, Department of Ecology and Evolutionary Biology, University of Tennessee, Knoxville, TN, USA

Edward O. Wilson, Museum of Comparative Zoology, Harvard University, Cambridge, MA, USA

Scientific and Public Council

The national collections of natural history and all collections-based activities are recognized as a project of national significance. Therefore we felt that we would do well to have a Scientific and Public Council to represent the public interest, whether in science, education, culture or tourism. We have asked a group of leaders in their respective fields to serve as members of this council; Many members have already supported us over the years, helping out in their different areas of expertise.

Ruth Arnon

Itamar Borowitz

Yehudith Birk

Gedalya Gal

Ariel David

Yael Dayan

Ariel Weiss

Samuel Hayek

Yossi Vardi (observer)

Ilan Chet

Yaakov Turkel

Ami Federman

Aaron Ciechanover

Shoni Rivnai

Shimshon Shoshani

Michael Steinhardt

Brian Sherman

Meir Shalev

Martin Weyl

Scientific and Public Supervision

Steering Committee under the auspices of the Israel Academy of Sciences and Humanities which represents the collections to the Budget and Planning Committee of the Council of Higher Education: Yehudith Birk (Chairperson), Tamar Dayan, Yossi Loya, Yael Lubin, Rafi Mechoulam, Oded Navon, Ehud Spanier, Yossi Segal.

Steering Committee of the collections as a knowledge Center of the Ministry of Science: Yehudith Birk (Chairperson), Shai Avriel, Tamar Dayan, Bella Galil, Menachem Goren, Husam Massalha, Lea Pais.

Sponsors' Steering Committee: Sinaia Netanyahu (Chair), David Mingelgrin, Yoav Motro, Yoni Even-Tov, Eldar Kazevith, Neri Azogui, Tamar Dayan.

Steering Committee for the Israel Taxonomy Initiative, consortium of 19 organizations (Ministry of Environmental Protection, Ministry of Agriculture, Ministry of Health, Ministry of Science, universities, Academic Colleges, research institutes, Israel Nature and Parks Authority, Keren Kayemet LeYisrael, Society for the Protection of Nature): Michael Ottolenghi, Yossi Steinberger, Yael Lubin, Bella Galil, Alan Matthews. Observer: Ran Levy. Tamar Dayan and Menachem Goren direct the initiative.

Staff

Prof. Tamar Dayan – Director
Dr. Menachem Goren – Deputy Director
Dr. Revital Ben-David-Zaslow – Administrative Director
Avigail Ben-Dov-Segal – Administrative Support
Tirza Stern – IT specialist

Zoological Museum

Department of Zoology, George S. Wise Faculty of Life Sciences

Division of Terrestrial Vertebrates

Dr. Shai Meiri – Curator of Amphibians, Reptiles, and Mammals
Dr. Roi Dor – Curator of Birds
Prof. Tamar Dayan – Curator of Mammals
Prof. (emeritus) Yoram Yom-Tov – Curator emeritus
Arieh Landsman – Collection Manager – Reptiles and Mammals
Erez Maza – Collection Manager – Amphibians and Reptiles
Daniel Berkowitz – Collection Manager – Birds and Mammals
Kesem Kazes – Technical Support – Reptiles
Avigail Ben-Dov-Segal – Forensic Ornithology, Bird Strike Monitoring
Igor Gavrilov – Taxidermist
Dr. Stanislav Volynchik – Taxidermist
Amir Glik – Technical Support – Taxidermy
Dr. Anat Haber – VATAT Supported Post-Doctoral Fellow – Mammals

Division of Fishes

Dr. Jonathan Bellmaker – Curator of Mediterranean Fishes
Dr. Roi Holtzman – Curator of Red Sea Fishes
Dr. Menachem Goren – Curator emeritus
Prof. (emeritus) Lev Fishelson – Curator emeritus
Dr. Revital Ben-David-Zaslow – Collection Manager
Nir Stern – Technical Support

Division of Invertebrates

Prof. Yehuda Benayahu – Curator of Octocorallia (Anthozoa)
Dr. Frida Ben-Ami – Curator of Mollusca
Dr. Noa Shenkar – Curator of Tunicata
Prof. Micha Ilan – Associate Curator of Porifera
Prof. (emeritus) Yossi Loya – Associate Curator of Hexacorallia (Anthozoa)
Prof. Bella Galil – Associate Curator of Crustacea and Scyphozoa
Dr. Sigal Shefer – Collection Manager – Bryozoa and Porifera
Henk Mienis – Collection Manager – Mollusca
Oz Rittner – Collection Manager – Mollusca

Alex Shlagman – Collection Manager – Octocorallia (Anthozoa) and Crustacea
Ya'arit Leviit – Technical Support – Crustacea

Division of Entomology

Dr. Amnon Freidberg – Curator of Diptera
Dr. Netta Dorchin – Curator of Diptera
Dr. Vladimir Chikatunov – Curator of Coleoptera
Dr. Vasily Kravchenko – Curator of Lepidoptera
Dr. Sergei Zonstein – Curator of Arachnida
Dr. Zoya Yefremova – Curator of Parasitica (Hymenoptera)
Prof. (emeritus) Dan Gerling – Associate Curator of Parasitica (Hymenoptera)
Prof. Abraham Hefetz – Associate Curator of Hymenoptera
Dr. Yael Mandelik – Associate Curator of Hymenoptera
Dr. Moshe Guershon – Collection Manager – Hymenoptera
Dr. Wolf Kuslitzky – Collection Manager – Parasitica (Hymenoptera)
Dr. Armin Ionescu-Hirsch – Collection Manager – Hymenoptera
Dr. Tatiana Novoselsky – Collection Manager – Heteroptera
Leonid Friedman – Collection Manager – Coleoptera
Tirza Stern – Collection Manager – Auchenorrhyncha (Hemiptera)
Alex Shlagman – Collection Manager – Live Insect Collection
Elizabeth Morgulis – Technical Support
Rani Cohen – Technical Support
Dr. Efrat Gavish-Regev – VATAT Supported Post- Doctoral Fellow – Arachnida
Dr. Achik Dorchin – VATAT Supported Post-Doctoral Fellow – Hymenoptera
Dr. Irina Zonstein – VATAT Supported Post-Doctoral Fellow - Parasitica

Division of Molecular Systematics

Dr. Dorothee Huchon – Curator of Molecular Systematics
Prof. Eli Geffen – Associate Curator of Vertebrate Molecular Systematics
Dr. Tamar Feldstein – Collection Manager and Molecular Systematics Laboratory Director

Division of Paleontology

Dr. Yuri Katz – Curator of Paleontology
Dr. Olga Orlov-Labkovsky – Curator of Micropaleontology
Dr. Daniella Bar-Yosef – Collection Manager – Paleontology and Archeomalacology

Herbarium

Department of Molecular Biology and Ecology of Plants
George S. Wise Faculty of Life Sciences

Division of Algae and Lichens
Dr. Yaakov Lipkin (ret.) – Curator emeritus
Dr. Razi Hoffman – VATAT Supported Post-Doctoral Fellow – Algae

Division of Fungi
Dr. Nissan Binyamini (ret.) – Curator emeritus

Museum of Biological Anthropology

Division of Physical Anthropology
Department of Anatomy and Anthropology
Faculty of Medicine
Prof. Israel Hershkovitz – Curator of Physical Anthropology
Prof. Yoel Rak – Curator of Early Hominid Cast Collection
Prof. (emeritus) Baruch Arensburg – Curator emeritus
Yulia Avramov – Collections Manager – Physical Anthropology
Salima Yaser – Technical Support – Physical Anthropology
Barbara Astforov – Technical Support – Physical Anthropology
Dr. Rachel Sarig – VATAT Supported Post-Doctoral Fellow – Dental Anthropology
Hilla May – VATAT Supported Post-Doctoral Fellow – Ancient Populations (from February)

Division of Biological Archeology
Sonia and Marco Nadler Institute of Archeology
Faculty of Humanities
Dr. Dafna Langgut – Curator of Palynology and Archeobotany

Nature Campus

Public outreach Project of Science and Environmental Education – Partnership with the I. Meier Segals Garden for Zoological Research and the Botanical Gardens
Dr. Yael Gavrieli – Director
Tuvia Eshcoly – public Programs Coordinador
Ilil Pratt – Content Development and Website Coordinator
Bat-Sheva Rothman – Website Development
Anat Feldman – Editor
Halina Hamou – Chief Designer
~30 graduate students as guides

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.

Prof. Tamar Dayan and Dr. Menachem Goren – Directors

Profs. Leon Blaustein, Alan Matthews, Yossi Loya, Bella Galil, Yael Lubin – Steering Committee

Dr. Daniella Bar-Yosef – Coordinator