

The National Collections of Natural History at Tel Aviv University

2012/2013 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 2012/2013 was the 9th in which the natural history collections at Tel Aviv University enjoyed VATAT regular support. It was also the 6th year that the collections enjoyed the invaluable special support for training and collections improvement. It was also the 6th and last year that the collections enjoyed the support of the Ministry of Science and Technology, having been declared a Knowledge Center by the ministry. Most importantly – it was the first year that the collections enjoyed the new upgraded VATAT funding model, which made a very big difference. Consequently, in terms of training, collections care and improvement, we made highly significant progress promoting the collections as a research infrastructure and promoting collections-based research.

Progress with building a proper facility to house our collections and collections-based activities was finally significant and close to half the building skeleton has already been erected. We anticipate that the building will be finished within ca. 18-20 months. 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 2012/2013. 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 over 400 scientists used our collections for research, a 63% increase since 7 years ago and a moderate increase since the past year (see Table below). A particularly significant increase can be seen in the number of graduate students that used the collections for research (87%) and number of postdoctoral researchers (quadrupled). Only fewer than half of the researchers are affiliated with TAU while the others are affiliated with various academic institutions in Israel and abroad, government agencies, and even the industry. The upgraded VATAT support has helped dramatically in improving the collections as a research infrastructure and center of expertise.

The Israel Taxonomy Initiative, aimed to train the new generation of taxonomists in Israel and to promote biodiversity surveys, began its operation four 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 12 PhD students and 2 MSc students in Taxonomy are supported by ITI and taxonomy courses every year 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. 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 of this crucial field of research, but much work is still needed.

In the past year two new curators joined us: Dr. Jonathan Belmaker was recruited by the Department of Zoology and is now our Curator of Mediterranean Fishes. Dr. Dafna Langgut was recruited by the Institute of Archeology is now Curator of Palynology and Archeobotany. Both enjoy the incentive provided by VATAT to encourage hiring the next generation of curators. In October 2013 Dr. Roi Dor joined the Department of Zoology and is now Curator Terrestrial Vertebrates (Birds); Dr. Gal Ribak joined Zoology and serves as Associate Curator of Coleoptera, Entomology; Dr. Yossi Yovel of

Zoology joined as Associate Curator of Bats, Terrestrial Vertebrates. 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 2006-2013

Activity	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13
Number of TAU scientists who used the collections for research	45	47	54	58	61	67	70
Number of other scientists who used the collections for research	142	138	157	164	211	239	214
Number of graduate students who used the collections for research	60	69	69	69	78	82	112
Number of post-docs who used the collections for research	3	2	6	4	6	11	12
Number of refereed articles of research who used the collections	171	235	209	222	206	237	290
Number of scientific books based on the collections	11	7	10	3	3	8	11
Number of courses that used the collections	21	20	19	21	22	25	26
Number of participants in 'Nature Campus' activities	10,800	7,020	7,926	10,312	10,363	8,104< *	10,533
Number of entries to 'Natural History Collections' website (starting 2009/10)	---	---	---	9,900	10,700	11,700	12,178
Number of entries to 'Nature Campus' website (starting 2009/10)	---	---	---	26,100	26,500	27,800	29,023
Number of entries to 'EarthWeb' website (starting 2009/10)	---	---	---	15,500	15,100	20,600	30,183

* Due to technical malfunction part of the visitor's records was lost

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 by 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 taxidermist. 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 and under-staffing, 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 overworked 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 also report a little about 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

The staff members of TAU National Collections of Natural History Collections continue their activities to promote and preserve the various collections. As in previous years, we have put much effort into advancing our goals. 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, and assist graduate students, academic courses, and “Nature Campus” activities.

During the academic year 2012/2013 we received and incorporated many specimens of various taxonomic groups collected worldwide by the collection curators and staff, students, rangers from the Israel Nature and Parks Authority, and others. Almost 20,000 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 500 new specimens of soft corals were added this year.

Much work was done this year to organize the Crustacean collection. Ya'arit Leviit is reorganizing the collection and started to computerize and update the taxonomic definitions. This group has an enormous significance to the ecologic system and commercially. This days Ya'arit started her Ph.D. on this group.

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. 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. 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. 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 transferred their samplings together with the collecting data to the museum.

2013 annual report - Entomology collections (including Arachnids)

Netta Dorchin, Amnon Freidberg , Moshe Guershon, Dan Gerling, Vladimir Chikatunov, Vasilyi Kravchenko, Sergei Zonstein, Tanya Novoselsky, Zoya Yefremova, Wolf Kuslitzky, Armin Ionescu, Dany Simon, Tirza Stern, Leonid Friedman, Alex Shlagman, Oz Rittner, Liz MorgulisEfrat Regev-Gavish, Achik Dorchin, Avi Keysari

General Introduction

The Israel National Insect Collection of Insects is estimated to contain more than 2 million specimens, constituting more than 50% of the total animal specimens of our Zoology Museum. The main mission of the entomological staff is to study and document the Israeli fauna, but the collections also contain thousands of specimens from other parts of the world, e.g., Africa, Europe, North America and the Far East, reflecting collecting activities of our personnel according to their taxonomic expertise. The arachnid collection is included as a daughter collection and contains mainly spiders, but also other arachnids, such as Solifugae, Scorpiones, Opiliones and Pseudoscorpiones.

Most of the new material that is added to the collection comes from continuous collecting efforts of the museum staff and students, as part of taxonomic, ecological and biodiversity studies in various regions of Israel. Additional material is donated/ integrated regularly from professionals, amateurs, and more sporadically from the general public.

Main activities

Reorganization of the Entomology staff

The approximately 70+ year history of accumulating collections (national and international in scope) by continuous active collection, and the absorption of collections from private and institutional sources resulted in a rapid and sometimes unplanned expansion of the entomological collections. In light of the forthcoming move to the new building, this situation necessitated reorganization of the Entomology section, which was done in consultation with Dr. David Furth, the Entomology collections manager at the National Museum of Natural History at the Smithsonian Institution (Washington, D. C., USA) during his 6-month visit to TAUI in 2013.

Following David's visit, overall goals of the entomological unit were redefined, as well as new position titles and job descriptions, and a work plan that included procedural changes and some suggested collection projects (individual and group/team) was prepared. One of the most important aspects of this new work plan was to create a position for a Collection Staff Manager, to assist the Head Curator in coordinating collection projects and activities and improve communication among members of the entomological staff.

In parallel with the reorganization of manpower, a considerable effort was made, with a major involvement of David, in moving and re-arranging (scientifically and logistically) the entomology collections, in several floors of the Sherman Building in order to better recognize and address specific issues. Among other activities, temporary labels were attached to all cabinets in the main collection room (209) to indicate the contents of each cabinet and thus improve

accessibility of their contents. This constitutes a preliminary step towards a complete digitized mapping of the collection (see Databasing section).

New integrated collections

- Hazeva Collection: aprox 200 specimens of the Arava valley fauna with a relatively big representation of ants of this area.
- Ministry of Agriculture (Volcani Center) Collection. A 'rescue integration' of an old, neglected, and considerably damaged collection, resulting in the finding of several important and rare specimens from the early 20th century, including some type specimens.
- Haifa University Collection: part of the bee collection (Achik Dorchin's, aprox. 2500 specimens).
- "Seminar HaKibbutzim Collection": small collection including remnants of Yaakov Ofer's ant collection.

Estimated number of newly added specimens

- Coleoptera: 4000
- Diptera: 4000
- Hymenoptera: 2500 Ichneumonidae, 2000 Cynipidae (gall wasps), 1000 Braconidae, 1000 other parasitic wasps, 1000 Formicidae, 3200 Apoidea (bees), 150 Others (wasps, etc.)
- Aleyrodidae: 200 (whitefly slides)
- Other insect groups: 250
- Arachnida: 1500 (spiders)

New species, new records and newly located types

- Ant collection: *Messor grandinidus* – a new species for Israel
- Coleoptera (Glaphiridae) collection: Type specimens of *Eulasia daccordii* Uliana & Sabatinelli, 2013 and *Glaphyrus orbachi* Sabatinelli, Miessen & Rittner, 2012. Recent new species to our fauna includes *Scarabaeus irakensis* Stolfa, 1938, *Myrrha octodecimguttata* (Linnaeus, 1758) and

Epuraea ocularis Fairmaire, 1849. Most were discovered during collecting with light traps.

- Diptera: several new records and/or new (undescribed) species of herbivorous and predatory gall midges (Cecidomyiidae) were added to the collection as part of ongoing projects.
- Hymenoptera: several new records to Israel as well as undescribed species of oak gall-wasps (Cynipidae) were added to the collection as part of an ongoing project.
- Arachnid collection: Three new species from the family Linyphiidae were described.

Special species/specimens

- Ant collection: *Linepithema humile* (Argentine ant), a new tramp-species in Israel was identified for the plant protection services.
- Arachnid collection: Few specimens of an undescribed new record (or a new species) from the order Amblypygi, collected in Susita Cave by Gil Wizen, were added to our Arachnid collection. These are the first specimens of this order in our collection.

Routine maintenance work and minor changes were done in various groups including Neuroptera, Tettigonoidea, Mantodea, Blatodea, Phasmida and other groups.

Special projects:

The Types catalog

A comprehensive type catalog of the insect collection is to be completed by next year. Special effort has been made by Oz Rittner in the Coleoptera collection, which will serve as an example for the other orders. Because many types were missing from this collection, contact was made with the relevant scientists and a great majority of the missing types was gladly returned. These are mainly types of Elateridae but also Cerambycidae and Scarabaeidae. Other types are still missing and efforts are being made to locate and return those as

well. Computerized forms are now being employed for all loans or donations, and this will hopefully prevent the loss of material in the future (see Databasing section).

The Reich collection.

This large Lepidoptera collection is now in the process of reorganization as it has not been fully accessible. Old and damaged drawers are being replaced with new ones. The Reich collection holds Lepidoptera from all over the world, with an emphasis on moths of the subfamily Arctiinae. A type catalog of this collection is being prepared, including photographs of types that were sent to experts, and this has already proved the collection's importance for American Arctiinae systematics. The Reich collection is also of historical importance, and revealing its history as well as that of its late owner is underway in collaboration with Henk K. Mienis.

Services, contacts and cooperations

Identification services

We keep providing critical identification services to the PPIS (Plant Protection Services, Ministry of Agriculture), and the Ministry of Health; Following the ID, the customs authority intercepted two species of large fire ants, *Solenopsis geminata* and *S. xyloni*, from the USA. the NPA (Nature and Park Authority) - dragonfly collections, research institutions (Tel Hai) - ant collection, Faculty of Agriculture at the Hebrew University - bee collection, Ben Gurion University - beetle collection. Samples were also identified for: Haifa and Ashdod ports; Entomological Laboratory, Ministry of Environmental Protection and National Center for Agricultural Research and Extension (NCARE)

Education

The living insect collection provides routine services to academic courses (Insect Faunistics, Excursions to the Zoological Garden), to visits in the Entomological Collections, and to Nature-Campus, where live insects are used

for demonstration of biological phenomena and principles. Material from the general insect collection is also used in these activities.

All collection managers participate in 'ID days' devoted for the personal insect collections of students in the Insect Faunistics Course.

Databasing status

Data of 13,771 new specimens were added to the database in 2013, for a new total of 145,628 insect specimens. These include 3268 new entries with taxonomical ID (from a total of 33,623) and 600 new entries in the Arachnid database (for a total of 1800).

Special database projects:

- Digitized mapping of the insect collection is being done. As part of the mapping a protocol of follow-up of movement within the collection is being prepared.
- Loans: all loan procedures (including forms and follow-up) is now done through the database.
- Type catalogue: all data labels of ca. 101 holotypes that are part of our collection have been added to the database. The new total of databased holotypes is now 521.
- Palmoni Collection: the Palmoni collection that was received several decades ago is being databased by Avi Keysari, a volunteer in the insect collection. During the last 6 months, he entered the data of ca. 1200 specimens from the Heteroptera families.
- We currently work on standardizing spelling of locality names for the entire zoological collections.

ITI activities

- Wolf Kuslitzky collaborates with Elad Chiel (University of Haifa in Oranim) in the ITI survey: "The parasitoids of *Musca domestica* in the different areas of Israel".

- Netta Dorchin collaborates with Zvi Mendel (Volcani Center) conducted an ITI survey of predatory gall midges on mealybugs in agricultural areas.
- Tanya Novoselsky and Netta Dorchin won an ITI survey grant to study the family Tingidae (Hemiptera) in Israel.
- Efrat Gavish-Regev co-hosted two ITI courses:
 - Spiders of Israel: Taxonomy and functional morphology. Instructor: Dr. Robert Raven, Head of Terrestrial Biodiversity & Chelicerata Senior Curator, Queensland Museum, Australia.
 - Systematics and Diversity of Scorpions, with Introduction to the Israeli Fauna. Instructor: Dr. Lorenzo Prendini, Division of Invertebrate Zoology, American Museum of Natural History, New York, USA.

New equipment and infrastructure

- 300 drawers with internal specimen trays were manufactured according to general TAUI standards.
- 3 new insect cabinets were added.
- 4 new PCs were added to the entomology section and an old one was renovated specifically for databasing use.

Annual report, tetrapod collection

Shai Meiri, Roi Dor, Tamar Dayan, Yossi Yovel, Tamar Feldstein, 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 a curator of birds. This will only officially take place in October 2013, but Roi is now a museum postdoc, and has already started to influence policy and advance various issues concerning the bird collection and the tetrapod collections in general. Roi is an extremely qualified evolutionary biologist and ornithologist,

and we already see that our prediction from last year - that he will make a most valuable addition to the curatorial staff, is coming true.

We are also delighted to have a new adjunct curator of bats, Dr. Yossi Yovel. Yossi, a new member of the Faculty of Life Sciences and the Department of Zoology, studies bat sonar and bat biodiversity in Israel and abroad and is now, as a curator-adjunct, looking for ways to improve the traditional bat collection, as well as including datasets of CT scans, photos and sounds (including ultrasound) recordings.

Tamar Feldstein has started working in the museum's soft-tissue collections, she is not only helping out the preparators in preparing the frozen tissue samples, and in dealing with requests for shipment of such samples, but has also revised the working procedures with genetic material, in the newly established molecular lab. Tamar is also in charge of doing genetic work in collection-enhancing project, and in the tetrapod collections is trying to solve some taxonomic puzzles regarding unidentified specimens in the collection.

Stas Volynchik started working full time as a preparatory, and has contributed immensely to the influx of new specimens into the collection, with a new collection emphasis on the preparation of study skins. Igor, our senior preparator, is training Stas in the various sub-arts of taxidermy, following a detailed plan he prepared last year. With the increasing flow of material into the collections and the needs of the displays for the new building now being erected the preparation looks like it is becoming a bottleneck of sorts in the process of collection enlargement. We are therefore examining options to have a student, or perhaps a part-time worker, join the preparatory team. Daniel Berkowic, the collection manager of the dry collections, is spending one day a week doing taxidermy work. Daniel, Kessem, Erez and Arieh continue their brilliant work mainly in the collections.

The new molecular lab and old dry collection

We have dedicated part of the dry collection office, and part of the dry collection room, to a new lab in which we carry out all tissue and molecular work in the collection. The post-PCR lab is in the 2nd story of the building (in the office) and the extraction lab is in the basement with the collections, but now separated from it by a portable screen. People can no longer enter the collection from the old main entrance, for fear of contamination (the entrance will be available only in special cases, when the elevator must be used). This has necessitated replacing the northern door of the dry collections room, and re-wiring some of the electricity so the alarm and lights can now be operated from the northern entrance. Daniel and Kessem have continued to improve the dry collections and the collection facilities, overseeing installation of new air conditioning units, which keeps the temperature and humidity to adequate levels. They have also faced a plague of mosquitoes that started breeding in the southern collection rooms. A major project now is a re-arrangement of the large-mammal skin collection, both as a goal in itself (the collection is in shameful condition, and various water and sewage leaks over the last few years did not help it), and in anticipation of the purchase of new dry collection cabinets.

Collection growth and active collecting

Between July 25th, 2012 and September 8th, 2013 and our amphibian collection has grown by 46 specimens to 2461. Most new specimens are ones housed until last year in the lab of Avital Gasith, and not representing new collecting. Three species are nearly equally numerous among the new specimens: *Bufo viridis*, *Salamandra inframaculata* (most from the NPA) and *Pelobates syriacus*. These figures do not include three specimens of the recently re-discovered Hula painted frog, formerly *Discoglossus nigriventer*, now *Latonia nigriventer* which were promised to the collection by Sarig Gafni and Eli Geffen for after they revise the species. This they now did, but they continue to study the specimens

and we have not received them yet. Only 2 specimens altogether were collected in 2013.

Over the same period the bird collection has grown by 434 specimens to 17465. Most birds are brought in from the wild animal hospital of the Nature Protection Authority (NPA). We have also initiated connection with bird ringers around Israel who already started contributing specimens, mostly of smaller birds that we do not get often. The most common bird species collected in 2013 was the house sparrow (*Passer domesticus*, 17 specimens – all of them collected by the new curator). The mammal collection has grown by 310 new specimens catalogued since July 2012 – to 13433 specimens. Most of these mammals were collected by NPA rangers, or brought from the wildlife hospital. The most common mammals we receive (those that died in 2013) are still golden jackals (*Canis aureus*), gray wolves (*C. lupus*), and mountain gazelles (*Gazella gazelle*) – to which list we should add another large species, the striped hyena (*Hyaena hyaena*, 8 specimens from 2013). Obviously the NPA is still unaware of the fact that there are mammals smaller than 1kg (although we did get a single *Vormela* specimen from them), or that there are such mammalian orders as Rodentia, Eulipotyphla or Chiroptera, from which we have received no specimens from the rangers.

The reptile collection has grown by 479 specimens, the largest growth since the last report of all tetrapod collections, to 16436 specimens. Most of the new (2013) specimens are the starred agama (*Stellagama stellio*), as well as the Aegean *Podarcis erhardii* that the curator brought from his studies in Greece. 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 virtually no reptiles (three specimens in 2013), despite our efforts to educate them. Hopefully the appointment of Roi Talbi to the Eilat District

Biologist, and the good connections with the biologists of the Northern, Central and Southern divisions, as well as the workshop we held for the central division, will ameliorate things.

Connection with other bodies

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. Roi has learned to identify bird remains and is now working in this capacity until Avigail returns from maternity leave.

We keep maintaining special, good although sometimes strained ties with the Nature and Parks Authority (NPA). This has been expressed this year in a reptile workshop we conducted for the NPA rangers of the Central Division. Unfortunately, and despite repeated invitations, the NPA enforcement and science divisions have not accepted (but did not actively decline) our invitations to hold a workshop in the museum for their people.

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. Roi Dor and Daniel Berkowic organized a successful meeting with ringers in the collections, and hopefully it will bring new small birds to the collections. We have also been in contact with the hoopoe Bird Centre in Yeruham, who seem eager to help. We have agreed to purchase freezers to the hoopoe centre, and the Jerusalem ringing station, with the aim of them using them to keep specimens for us. We have done so with the Society for the Protection of Nature centre in the Hula “Agamon”, which we hope will prove fruitful. We made little progress trying to move to TAU two historically important collections (both of the late Israel Aharoni) – one is at the Hebrew University (which flatly refused our initial advances – or rather blatantly ignored them) and one in a school at Beit Jalla. Both collections are hardly used, and for

teaching when they are used. We would like to offer these institutions to prepare new dedicated bird specimens for them in return for the scientifically important ones. Our chances of success are not looking good.

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, and wolves). We started collecting birds' wings since study-skins do not show wing feathers well. This will support research as well as species and age identification by ringers in the field. We have also started collecting tissue specimens of vertebrate specimens 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 not enough cabinets are being purchased. 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 very big (~100 Liter) plastic containers for alcohol-preserved specimens to replace existing inadequate ones.

Igor and Stas continue to improve the infrastructure of the preparation area. I still believe sanitation there can and should benefit from marked improvement, and hope that conditions can be improved further in the near future.

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. We are moving skins of large mammals from the horrible hangers to shelves, which saves much space. This is likely to be a prolonged process. 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. Fire hazard in an alcohol-filled inadequate shed is real. AS a curator I am ashamed that much of the museum staff works in such conditions in my institution.

There was no progress this year in making the collections better available to the research community and the public in general through the web – except in planning. I hope the situation will improve soon. There are also plans to place barcodes on labels and readers on cupboards, to improve curation.

Daniel has started computerizing the egg collection – and is about 3/4th way finished. He will finish digitizing it within a year. The nest collection is still not computerized and its fate needs to be decided.

Annual Report: The Feather Identification Lab at the Steinhardt National Collections of Natural History

Avigail Ben-Dov Segal and Roi Dor

Military and civilian air traffic has increased dramatically over the last decade in Israel. This heavy traffic shares air space with half-billion migratory birds that pass through Israel twice a year (as well as resident birds), which hold a tremendous risk of bird strikes that may lead to damage and even loss of lives. Identifying the risks is an important step in order to prevent bird strikes and improve flight safety. Therefore, it is essential to identify the bird species that are responsible for bird strikes.

Since 2011 the Feather Identification Lab is working with the Israeli Air Force, the Israel Airports Authority, the Civil Aviation Authority and the Israel Nature and Parks Authority to identify feather remains. In 2013 official contracts were signed between the Feather Identification Lab (TAU) and the Israeli Air Force, the Israel Airports Authority and the Civil Aviation Authority to provide all feather identification for bird strikes in Israel. The lab provides over 100 bird strikes identifications annually. In addition we also provide feather identification for Israel Nature and Parks Authority, mainly to detect poaching of wild birds. Avigail Ben-Dov has headed the lab since its establishment and this past year Roi Dor has joined the lab, was trained by Avigail in all aspects of feather identification, and substituted her during maternity leave.

The Lab's main goal is to identify feather remains (mainly from air strikes) to the lowest possible taxonomic level. Feather identification is conducted through preparation of histological slides for microscopic identification as well as through morphological identification of feathers. Recently the lab purchased a new phase microscope that will improve our histological identification abilities and enable photo documentation of microscopic slides. We have a comprehensive comparative collection of histological slides of many Palearctic species that is used for microscopic identification, as well as a large

comparative feather collection that we continue to expand. Our location as part of the Steinhardt National Collections of Natural History enables us to take advantage of the largest regional collection of bird specimens (> 17,000), which is an invaluable resource for identifying feathers.

In cases where there are no remains that can be identified morphologically or histologically or in cases where our identification does not meet the desired taxonomic level we collaborate with the new molecular lab at the National Collections of Natural History (headed by Tamar Feldstein) for genetic identification of remains from air strikes. This new tool compliments our microscopic and morphologic identification abilities and enables us to identify bird species even from blood stains or small tissues. This year, we conducted a pilot project in which we genetically identified bird species from 17 cases of bird strikes in very high level of success (from feathers, blood and tissue remains). Using this method we even identified one case of a bat strike!

Progress Report Ascidiacea Collection

Noa Shenkar

Ascidians (Phylum Chordata, Class Ascidiacea), or sea squirts, are the largest and most diverse class of the sub-phylum Tunicata (also known as Urochordata). They comprise approximately 3000 described species found in all marine habitats from shallow water to the deep sea. The class Ascidiacea presents fundamental opportunities for research in the fields of development, evolution, ecology, natural products and more. During 2012-2013 the Ascidiacea collection at the National Collections of Natural History has been greatly advanced. The establishment of the new Shenkar lab at the Zoology Department, Tel-Aviv University, dedicated to the study of ecology of ascidians along the coasts of Israel, Mediterranean and Red Sea, has greatly promoted the collection by adding numerous specimens and by sorting the existing material. Over 150 specimens were added this year, and identification to species level

was carried out on over 50 specimens. The following species have been added to the inventory list: *Diplosoma simile*, *Pycnoclavella communis*, *Ployclinum aurantium*, *Styela plicata*, *Styela canopus*.

We are continuously working on promoting the “Ascidiacea Field Guide to the Mediterranean and Red Sea coasts of Israel”, a mission we hope to complete following the “Ascidiacea Taxonomy workshop” held by Noa Shenkar and Gretchen Lambert with the support of the Israeli Taxonomy Initiative during March 2014. In addition, several projects are being carried out by the Shenkar team:

***Eusynstyela latericius* – using molecular tools to distinguish between two morphotypes:** The colonial ascidian *Eusynstyela latericius* is a common encrusting ascidian in Eilat. The ascidian appears in two very distinct morphotypes. However, using phenotypic identification, it has been concluded in the past that both morphotypes belong to one species, despite the vast morphological differences in colony structure. In order to verify that both morphotypes belong to the same species, we are conducting molecular analysis using COI and 18S rRNA genes. We have collected several samples of two different morphs of *E. latericius* from several locations along the coast of Eilat, and they are currently undergoing molecular analysis in the museum.

Studying Herdmania momus and Microcosmus exasperatus introduction patterns: We are conducting periodical surveys along the Mediterranean coast of Israel and expanding the available data regarding the distribution of the non-indigenous species *Herdmania momus* and *Microcosmus exasperatus*. These species are of particular interest due to their potential effect on the native fauna, and we are currently trying to involve the recreational diving community for data collection.

Tissue collections - Annual Report – 2013

Tamar Feldstein

Construction of a molecular biology laboratory in the Zoological Museum.

The molecular laboratory of the Zoological Museum offers a molecular identification service for museum samples. The resulting molecular data expands the information available on unique samples and contributes to curation of the museum collections. In addition, we provide molecular barcoding services for external authorities.

The Molecular Biology Facility was officially open in April 2013. The facility consists of a pre-PCR bench for tissue processing and DNA extraction, a post-PCR room for gel electrophoresis and preparation of samples for sequencing, and a desk for computer analysis. The laboratory is fully equipped with the necessary equipment to conduct DNA isolation and PCR amplifications. It has a PCR machine with a dual thermal cycler chassis, a bench top refrigerated centrifuge and a gel documentation system. To avoid contamination, a UV cabinet is dedicated to DNA extractions and PCR preparations.

Molecular identification services for TAU researches and external authorities

In 2013 I was involved in several projects including the identification of invasive species (phylum Crustacea), cryptic species (Urochordata), new records to the Israeli fauna (Crustacea and Porifera) and the identification of blood and tissue samples from airplane bird strikes.

This activity is summarized in the following table:

Researcher and affiliation	Species	Description
Frida Ben-Ami -TAU*	<i>Scapholeberis rammneri</i>	Identification of a crustacean from the family Daphniidae. This is a new record for the Israeli fauna.
Noa Shenkar -TAU	<i>Eusynstyela laterticius</i>	Identification of a cryptic species within two morphs of a Red Sea tunicate.
Dana Milstein -INPA**	<i>Triops cancriformis</i>	The re-discovery of <i>Triops cancriformis</i> in winter ponds.

Dana Milstein -INPA	<i>Cherax quadricarinatus</i>	Identification of an invasive crayfish.
Israel Airports Authority	<i>Birds</i>	Identification of 14 species of birds and one bat from airplane strikes. Total of 22 samples. Three samples were not identified.
ITI*** - Sponge survey	<i>Demospongiae</i>	Identification of 35 Mediterranean sponge species using three different gene markers.

*Tel-Aviv University,

**Israel Nature and Parks Authority

***Israel Taxonomy Initiative

Processing new tissue samples for the bird, mammal and sponge tissue collections

As part of the routine work in the tissue collections I receive tissue samples from each new addition to the collections and I am responsible to preserve triplicates of tissue in ethanol, mark them and edit the databases accordingly. The samples from the different tissue collections are available for researches worldwide.

Porifera and Bryozoa collections – Annual Report – 2012/13

Sigal Shefer

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 100 m, in Herzliyya, and from 4-30 m in Eilat. Eight specimens were added to the collection

Porifera: This year samples were collected during four excursions. Three of them were to the mesophotic sponge ground located at depth of 100m, off Herzliyya (36 specimens), and one to Zanzibar Island, Tanzania (32 specimens). One specimen was added to the collection from Akziv. Over all 69 specimens were added to the collection this year.

The sampling excursions to 100m depth were part of studies conducted at Micha Ilan's lab and a deep sea survey of the Israeli Nature and Park Authority.

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 49 Bryozoa species (out of the 49 species 11 were identified in the past year) of which 27 are first record in Israel.

- Two species, *Drepanophora tuberculata* Osburn, 1914 and *Mucropatreliella thenardii* Audouin, 1826 are first record of their genus in the Mediterranean and are probably lessepsian migrants as both have tropical distribution. *M. thenardii* was mentioned by Kress in 2002 on artificial reef off Haifa but as the paper does not relate to the species as a first record in the Mediterranean and has no museum depository, it appropriate to mention it in this list.
- One species is a new species belong to the genus *Licornia*.
- One species is a new genus, not described yet

Porifera: Based on morphological characteristics and molecular analysis, we identified 37 sponge species belonging to 11 orders.

Molecular and morphological identification of the samples was supported by the Israel Taxonomy Initiative (ITI) as part of a surveys entitled: "Taxonomy of the Israeli Mediterranean demosponges", by Sigal Shefer, Tamar Feldstein, and Micha Ilan.

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

Porifera: The sponge collection is going through an archiving process. This process included updating scientific names, printing new labels and replacing fixative solutions.

Courses and Training:

Bryozoa: In the last year Mrs. Noga Sokolover visited the Natural History Museum (NHM), London and the university of Vienna (6-31.1.2013) where she was hosted by Dr. Paul Taylor and Dr. Andrei Ostrovsky. The visits to the NHM included usage of the low environmental SEM (LEO 1455 VP SEM) that allows scanning large uncoated samples. During the visit in Vienna it was possible to consult Dr. Javier Souto who is an expert on Bryozoa from the western Mediterranean. Also a large quantity of Bryozoa literature, mainly old literature that cannot be found on-line was collected as Pdf's file.

Porifera: In March 2013 I participated in a taxonomic training on Tropical sponges of Zanzibar Island, that took place at the Institute of Marine Sciences in Zanzibar, Tanzania. This training improved my ability to identify tropical sponges.

Museum Sample loans:

A SEM picture of *Monoporella bouchardii* (TAUBR25000) from the Mediterranean coast of Israel (Achziv canyon) was sent to Prof. Jean-Georges Harmelin (Université de la Méditerranée). The sample was identified as similar to samples from Lebanon, Turkey and Greece and will appear as the southernmost record of *M. bouchardii* in the Mediterranean in a paper (in prep.). In this paper Prof. Harmelin suggests that these species should be resurrected as *Flustra bouchardii* Audouin, 1826

Taxonomic identification service:

Seven sponge samples were identified for the Israel Oceanographic and Limnological Research (IOLR).

Causes and Consequences of Fish Invasions

Jonathan (Yoni) Belmaker

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

This year we undertook detailed measurements of Mediterranean and Red Sea fish ecomorphological traits from museum specimens. Research was principally carried out by a recent graduate (Ori Frid) and a Tel Aviv University undergraduate (Or Kiesar). This data will be used to test for biotic and abiotic constraints on traits diversity associated with fish invasion. We will complete these measurements during 2014.

We are developing species distribution models using (among other data sources) the collection georeferenced data to identify the geographical and environmental constraints on the distribution of invasive.

We are continuing fish sampling based on trawl catch as part of Itai va Rijn's PhD. We performed four sampling trips this spring and four more and scheduled for the fall. Sampled fish are being used to quantify how mortality and growth differ between invasive and native species based on otolith measurements.

We undertake a fish sampling expedition to the western Mediterranean in September (Banyuls, France) which included, apart from myself, two graduate students (Renanel Pickholtz, Itai van Rijn) and a technician (Shahar Malamud).

One PhD student and two Msc students are involved in projects that directly benefit from the natural history collection.

Palynology and Archaeobotany Collection, Institute of Archaeology - activities report

Dafna Langgut Ph.D

The collection is focus on the Israeli flora and includes the followings:

- Pollen and Spores Collection
- Wood Collection
- Charcoal Collection

Actions related to the reference collections that have been taken during the past year:

- A visit to the “Economic Botany Collection” of the Royal Botanic Gardens Kew, (February, 2013). A meeting with the curator- Dr. M. Nesbit.
- Collecting new samples for the different collections, mainly from Tel Aviv Botanical Gardens (with the corporation of Y. Sapir).
- Identification of Wood course and Wood Reference Collection preparation, Royal Botanic Gardens Kew, (February-March, 2013). Tutor: Dr. Peter Gasson.
- Preparation of architectural planning for the Recent Archaeobotanical Laboratory, where the samples for the reference collection will be prepared.
- Receiving a startup grant of \$ 40,000 from the Vice President for Research and Development, Tel Aviv University, for buying equipment, among others for the Recent Archaeobotanical Laboratory.

- Buying a stereo-microscope (DISCOVERY V20) for wood and charcoal identification.
- Identification of botanical remains for the Israel Antiquity Authority (two contracts: Hirbeit Kseife together with Y. Tefer and The City of David together with Y. Gadot).
- Two courses are using the reference collections

In order to collect samples for research purposes I participate in the following archaeological excavations: Mashabey Sade – Negev Hills (January, 2013); Timna – Southern Arava (February, 2013); City of David – Jerusalem (April, 2013); Tel Bet Yerah – Sea of Galilee (July, 2013); Caesarea (July, 2013); Tel Azekah (August, 2013); Herodium (September, 2013).

Interesting information that was achieved by using the reference collection was in the research of: A dramatic discovery in Lake Kinneret: empires of the ancient near east collapsed as a result of a climate crisis. A study of fossil pollen grains in sediments that were extracted from the bottom of Lake Kinneret reveals evidence for a climate crisis that shook the Near East at the End of the Bronze Age (~1,250-1,100 BCE). The dry event was identified based on dramatic drop in arboreal pollen percentages and represent a period of ca. 150 years with severe droughts that brought about the collapse of the great empires of the Bronze Age.

Collection-based research: The transition to agriculture: a reflection from the skeletons

Hilla May

One of the most significant cultural processes in human history is the transition from subsistence based on food gathering and hunting to food producing (Neolithic/Agriculture revolution). This process was long in the Near East, started around 10,500 B.C.E (with the Natufian population) and lasted several thousands of years, to the end of the Pottery Neolithic period (around 4,300 B.C.E). During this time the social organization and economic activities changed considerably. Among the bizarre customs seen in the Pre-pottery Neolithic B period is the removal of the skull from the grave, its modeling in plaster, and its placement in a special location at the site. Such a ritual implies a powerful social regulation, classes stratifications, division of labor and ancestral cult. Yet, our knowledge of these skulls and what they represent is meager. Revealing the biological relationships among the people of a Neolithic village can shed light on crucial aspects of the populations' daily living, social structure and economic behavior.

Until recently, our ability to extract basic biological information from the bones found in the archeological sites dated to this period was greatly limited by the anthropological methods available. Biomechanical analysis, the application of mechanical theory to biological systems, is used to explain form and function issues, for example, the significance of variation in mandibular form and robusticity can tell us about the strains acting on past populations' mandibles and the applied biting force. Long bone cross-sectional geometry can be used to test hypotheses regarding daily activities, occupation and division of labor between the sexes.

Bone shape may be indicative for functional and locomotor behavior. Geometric morphometrics, the ability to preserve the geometry of the landmark

configuration throughout the analysis, enables to represent statistical results as actual shapes and to compare between different populations.

Furthermore, the ability to study the DNA of archaeological and historical skeletal material raises the opportunity to resolve open questions concerning ancient societies. Ancient DNA (aDNA) analysis has the potential to identify kinship patterns between groups of skeletons, maternal relationships being revealed by mitochondrial DNA (mtDNA) typing, paternal ones by studying markers such as short tandem repeats (STRs) on the Y chromosome, and general family relationships by typing autosomal STRs.

The Anthropological collection at Tel-Aviv University enables us to explore the impact of the agricultural revolution on several selected aspects of human life: physical load, food management, health and social structure.

In this study we use new, validated and reliable methods in order to expand our knowledge on the occupation and social structure of the Natufian/Neolithic populations, establishing their nutritional habits and examining their genetic composition to reveal kinship relationships between individuals buried together within a single grave.

The study population includes 479 individuals housed at TAU, divided into two groups: 203 Natufians and 276 Neolithic. All long bones and mandibles belonging to these populations underwent high resolution Computerize Tomography (CT) scan [Brilliance 64 (Philips Medical Systems, Cleveland, Ohio)] at Carmel Medical Center, Haifa Israel. Measurements are taken from CT images and from direct observation on the bones. In addition, we use 3D morphometrics to quantify femoral shape differences among the Natufian and Neolithic populations.

DNA is extracted from selected skeletal remains using Guanidine Thiocyanate and silica-based purification methods and GeneClean Ancient DNA Kit. DNA

extraction and pre-amplification steps for PCR are carried out in dedicated laboratories for ancient DNA studies. As archaeological remains are characterized with low amount of degraded DNA, we use primers that generate short amplicons (120-180 bp) to improve amplification success. Kinship relationships are traced using miniature STR amplification. Fragments are detected by electrophoresis in an ABI 310 Genetic Analyzer (POP-4 polymer). Data will be analyzed using Genotyper1 V2.5 and GeneMapper1 ID V3.2 software. Maternal relationships are revealed by mtDNA, the hypervariable region of the control region. Direct sequencing of PCR is carried out using the fluorescent dye-based BigDye Terminator system (Applied Biosystems) and resolved on an ABI DNA Sequencer (Applied Biosystems) at core laboratories affiliated with the universities. Sequences are individually examined; overlapping adjoining sequences are aligned and combined using Sequencher (Gene Codes Corporation). All sequences are compared to sequences on the GenBank database of the National Center for Biotechnology Information using the Basic Local Alignment Search Tool (BLAST 2.0). DNA sequences will be aligned using the software CLUSTALX (Thompson et al. 1997); alignment output will be visually inspected. Phylogenetic analyses of the datasets will be performed using maximum parsimony (MP), distance (e.g., Neighbor Joining, NJ), and maximum likelihood (ML) methods implemented in PAUP*, employing heuristic searches with 50 replicates of random taxon-addition and TBR branch swapping for MP and ML. The software Modeltest will be used to determine the model of DNA sequence evolution that best fit the data. The AIC model will be implemented in PAUP* using Modeltest generated likelihood settings for ML analysis, with the best ML tree then used to generate settings for the final PAUP analyses. These settings will be used for NJ or ME analyses (with ML distances) and for final ML analyses. Bootstrap resampling support will be based on 100 (ML) to 2000 (MP, NJ) replicates.

Research activities 2012/13

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. Archaeo-malacological shell assemblages of sites in Israel and in Turkey continued, with special emphasis on the following: The analysis of shells from the Late Bronze and Iron Age sites of Tel Rehov (directed by Prof. Amihai Mazar) is was completed and is about to be published. Two new projects were started: Manot Cave (directed by Ofer Marder of Ben Gurion University and Omry Barzilai of the IAA), and Tell Bet Yerach (directed by Rafi Greenberg and Sarit Paz of Tel Aviv University). Manot is a cave in the Western Galilee which was occupied during the Upper Palaeolithic period, 40-30,000 years ago and in which for the first time in Israel there is evidence for shellfishing. In addition dead shell were collected as ornaments, and some were discovered in the context of a burial, which would make it among the earliest ornamental grave goods. Tel Bet Yerah, near the southern shore of the Sea of Galilee was occupied during the Early Bronze Age. Apart for some Mediterranean shells, most of the assemblage consist of lake and river molluscs which might enable the future reconstruction of the site's environment during its occupation.

During 2012-13 I was an active member of the Organising committee of ICAZ ASWA work group conference (Haifa, Israel, June 2013). In addition, I took an introduction to palaeontology course at Ben Gurion University in Beer Sheva with Dr. Sigal Abramovich.

Progress Report for the Paleontological Collection 2012-2013

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 the fossils, the description of taxa and the detailed documentation of taxonomic lineages. She continued to work with the collections of foraminifera (thin-sections or slides) for an “**Atlas of the Foraminifera of the Carboniferous and Lower Permian deposits of the Uzbekistan and adjacent regions**”. She finished so far the collection of foraminiferal zones of the Upper Moscovian, Kasimovian and Gzhelian Stages (Carboniferous); Asselian and Sacmarian Stages (Lower Permian).

2. The Taxonomy and Biodiversity of the Upper Permian Foraminifera of Israel. During the past academic year she 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 ". She is taking care of the Permian Foraminifera, while Dr. Dorit Korngreen of the Geological Survey of Israel in Jerusalem is studying the Triassic Foraminifera.

Dorit Korngreen, Or Bialik, Olga Orlov-Labkovsky and Chaim Benjamini prepared a presentation for the "WORLD SUMMIT ON P-Tr MASS EXTINCTION & EXTREME CLIMATE CHANGE" held in Wuhan, China (June 13 – 15, 2013) on the topic “Querying oceanic acidification at the P-Tr transition on the Levant margin sector of the northwestern Gondwanan plate”.

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

1. A former aquatic mollusc fauna of the Yarqon River near Tel Aviv. A study of freshwater molluscs from an ancient water reservoir belonging to the "Seven Mills" near Tel Aviv revealed the presence of at least 11 species of which most of them have disappeared in the meantime from the Yarqon River. Important finds were those of a large Unionid species *Leguminaia saulcyi* (Bourguignat,

1852) and the freshwater limpet *Ferrissia clessiniana* (Jickeli, 1882). A report is currently in print in the Archaeo+Malacology Group Newsletter.

2. A first effort to locate the types of fossil Campanian molluscs described by Nathan Shalem from among the material in his former collection has resulted so far in the recognition of 16 samples representing 15 species (see elsewhere in this report). More type lots are probably still hiding among the mollusc material in this highly neglected collection, which had been transferred from one institute to another before it was finally donated to the Tel Aviv University.

New Acquisitions

During the past academic year again some fossil material was received for permanent storage in the paleontological collection. Most of these samples were donated either by colleagues at the Tel Aviv University or from colleagues and collectors abroad.

<u>Name</u>	<u>Brief description of the material</u>
M. Agren	Fossil land snails from Morocco and Western Sahara
S. Davis	Fossils from Spain and France
H.K. Mienis	Pleistocene (Eemian) molluscs from the Netherlands; Quartz crystal, fossil Echinoidea and rudist from Israel
O. Rittner	Upper Campanian mollusc from Israel
J. Robinson	Fossils from Cyprus

The Paleontological library

The following books were donated by HKM to the library of the paleontological collection:

Beurlen, K., 1964. Welche Versteinerung ist das? 176 pp. Kosmos Franckh, Stuttgart.

Denizot, G., 1958. Atlas des Fossiles. III Fossiles tertiaires et quaternaires. 3rd Ed. 134 pp. Éditions N. Boubée & Cie., Paris.

Greco, A., & Lima, N., 1974. Repertorio dei Molluschi Marini Plio-Pleistocenici della Sicilia, Parte I. 140 pp. Istituto di Geologia della Università di Palermo.

Greco, A., 1986. Repertorio dei Molluschi Marini Plio-Pleistocenici della Sicilia. Parte II ed Appendice. 327 pp. Istituto e Museo di Geologia, Palermo.

Kearey, P., 2001. The New Penguin Dictionary of Geology. 2nd Ed. P327 pp. Penguin Books, London.

Nordsieck, F., 1972. Die miozäne Molluskenfauna von Miste-Winterswijk NL (Hemmoor). 187 pp. Gustav Fischer Verlag, Stuttgart.

Prokop, R., 1994. Fossielen. 224 pp. R & B, Lisse.

**Catalogue of Type Specimens in the Paleontological Collection of the
Steinhardt National Collections of Natural History, Tel Aviv University, 1.**

Henk K. Mienis

A study of the molluscs among the paleontological material present in the collection of the late Dr. Nathan Shalem (1897-1959) has revealed so far the presence of type material belonging to 15 different taxa of fossil molluscs. The type material is listed here in systematic order.

MOLLUSCA
GASTROPODA
Family Turbinidae

Turbo magnolfae Shalem, 1928

Syntypes TAU MO 78281/10: Israel, Bettar (Battir), near the old train station.
In Green Clay of Campanian origin.

Family Cerithiidae

Cerithium delcampanai Shalem, 1928

Syntypes TAU MO 78273/9: Israel, Bettar (Battir), near the old train station. In
Green Clay of Campanian origin.

Family Aporrhaidae

Aporrhais larteti Shalem, 1928

Syntypes TAU MO 78279/3: Israel, Bettar (Battir), near the old train station. In
Green Clay of Campanian origin.

Family Epitoniidae

Scalaria grilli Shalem, 1928

Holotype TAU MO 78274: Israel, Bettar (Battir), near the old train station. In
Green Clay of Campanian origin.

Paratype TAU MO 78275: Israel, Bettar (Battir), near the old train station. In
Green Clay of Campanian origin.

Family Fascioliariidae

Fusus stefaninii Shalem, 1928

Syntypes TAU MO 78276/18: Israel, Bettar (Battir), near the old train station.
In Green Clay of Campanian origin.

Family Aglajidae

Acera eliai Shalem, 1928

Syntype TAU MO 78278: Israel, Bettar (Battir), near the old train station. In
Green Clay of Campanian origin.

BIVALVIA

Family Nuculidae

Nucula destefanii Shalem, 1928

Syntypes TAU MO 78270/3: Israel, Bettar (Battir), near the old train station. In Green Clay of Campanian origin.

Nucula sorianoi Shalem, 1928

Syntypes TAU MO 78271/4: Israel, Bettar (Battir), near the old train station. In Green Clay of Campanian origin.

Family Arcidae

Arca ielini Shalem, 1928

Syntypes TAU MO 78268/9: Israel, Bettar (Battir), near the old train station. In Green Clay of Campanian origin.

Arca ielini var. *picardi* Shalem, 1928

Syntype TAU MO 78269: Israel, Bettar (Battir), near the old train station. In Green Clay of Campanian origin.

Family Lucinidae

Lucina benvenistii Shalem, 1928

Syntypes TAU MO 78277/7: Israel, Bettar (Battir), near the old train station. In Green Clay of Campanian origin.

Lucina usieli Shalem, 1928

Syntypes TAU MO 78272/2: Israel, Bettar (Battir), near the old train station. In Green Clay of Campanian origin.

Family Cardiidae

Cardium eliai Shalem, 1928

Holotype TAU MO 78280: Israel, Bettar (Battir), near the old train station. In Green Clay of Campanian origin.

Family Veneridae

Dosinia predelettrei Shalem, 1928

Syntypes TAU MO 78287/2: Israel Motza. In Green Clay of Campanian origin.

Family Corbulidae

Corbula eretzisraelensis Shalem, 1928

Syntypes TAU MO 78288/12. Israel, Bettar (=Battir), near the old train station. In Green Clay of Campanian origin.

References

Shalem, N., 1928. Fauna nuova Cenomaniana delle argille Verdi Gerusalemme. Bollettino della Società Geologica Italiana, 47 (1): 69-108, pls. 3-5.

Progress Report for the Mollusc Collection 2012-2013

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

Research

During the academic year 2012/13 we continued to carry out research in the fields of taxonomy, systematics, nomenclature, Lessepsian migration and the presence of exotic and invasive species among the inland terrestrial and aquatic molluscs.

The field guide on the freshwater molluscs of Israel published by the Israel Nature and National Parks Protection Authority (INNPPA) (Milstein *et al*, 2012), based on an intensive cooperation between malacologists at the Tel Aviv University (Henk Mienis and Oz Rittner) and the freshwater ecologist of the INNPPA (Dana Milstein), has turned out to be a great success. Although it was written in principle for the use of rangers of the INNPPA, copies can be downloaded free of charge from the internet sites of:

The Israel Nature and National Parks Protection Authority,

the Tel Aviv University: www.mnh.tau.ac.il/upload//rekikhot-Ebook.pdf ,

and the Society for the Protection of Nature in Israel:

www.nature-conservation.org.il/BuildaGate5/portals/conservation/imagesP/sub21/218884807.pdf .

In the wake of that success we are currently writing another guide dealing with plant pests and additional exotic species among the terrestrial snails. This time we are cooperating with the Plant Protection and Inspection Services of the Ministry of Agriculture (Yoav Motro and Svetlana Vaisman).

Much attention has therefore been given to the exotic land- and freshwater molluscs occurring in Israel during the past academic year. Without doubt this will be a major subject of interest also in the coming year.

Noteworthy was the discovery of a very large population of *Rumina saharica* in gardens in Ramat Gan. The presence of that species has been mapped in part which effort will be continued during the next rainy season.

Various ecologically studies on the marine molluscs of the Eastern Mediterranean are currently being carried out by a number of students at the Tel Aviv University, Haifa University and Bar-Ilan University. Identifications are usually carried out in the mollusc collection of the Tel Aviv University and at least part of the identified material is being kept for permanent storage in the Steinhardt National Collections of Natural History. Lessepsian migrants play an important role in these studies. Although we failed to add a new species to the list of migrants, but Bogi & Galil (2012) managed to add *Pseudorhaphitoma iodolabiata* (see list of publications), it resulted in many new records of species which were so far known only from one or two samples for example *Septifer forskali*, two species of *Alectryonella* and an unknown species of *Psammotreta*.

From Rami Tsadok we received an interesting sample of molluscs collected at a depth of 950 m off Palmahim around gas seeps. We are still in the middle of sorting and identifying these molluscs, but they will add many additional species to the checklist of Mediterranean molluscs living off the coast of Israel.

New material, identification and computerization

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.

This year Mrs. S. Vaisman brought us for identification only 8 samples of land and freshwater snails intercepted by inspectors from the Plant Protection &

Inspection Services (PPIS) of the Ministry of Agriculture. At the moment the PPIS is coping with severe financial cutbacks and had to reduce its activities in the arrival hall at Ben-Gurion Airport. Yet some rather interesting species were present among the intercepted material like *Vitrina pellucida* on tree-trunks imported from Scotland, *Pila polita* from the luggage of a temporary labourer arriving from Thailand and *Xeropicta krynickii* found among dried *Salvia* arriving from Turkey. 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).

Between all these various activities we have maintained our focus on the completion of the incorporation of the land snail collection of Uri J. Bar-Ze'ev into the general Mollusc Collection and we continued our work on the very large collection of Zvi Orlin. Most of 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 59040 samples representing 8883 taxa in the mollusc collection have been computerized. The majority of the new species and subspecies (394) which we could add this year to the collection were again mainly from the collections of Zvi Orlin and Uri J. Bar-Ze'ev.

Cooperation with the Israel Nature and National Parks Protection Authority

The phylum Mollusca is protected by law in Israel. The only exception is being formed by a small group of Mediterranean Cephalopods which are of commercial interest. Any malacological fieldwork carried out by the authors of this report is carried out with a proper license supplied on an annual base by the Israel Nature and National Parks Protection Authority (INNPPA).

At the request of the INNPPA a survey of the mollusc fauna of 14 selected freshwater biotopes in the Hula Nature Reserve has been carried out by Henk K. Mienis, Oz Rittner, Revital Ben-David Zaslou (Tel Aviv University) and Dana Milstein (INNPPA). The preliminary results are given in the section: Malacological fieldwork carried out in Israel. A follow up study of the same site has been planned in autumn 2013.

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. For the small shell related ethnographical collection we received an interesting traditional belt adorned with beads made of the Cowry *Monetaria annulus*. During the academic year 2012/2013 material has been received directly or indirectly from the following persons:

<u>Name</u>	<u>Brief description of the material</u>
D.E. Bar-Yosef Mayer	Molluscs from Morocco and Hawaii
Y. Belmaker	Marine molluscs Eastern Mediterranean
N. Ben-Eliahu	Marine molluscs Eastern Mediterranean
C. Bogi	Marine molluscs Eastern Mediterranean
M. Costa	Freshwater molluscs from Israel
K. Dan	Marine molluscs Andaman Islands
A. Danin	Land snails from Jordan
S. Davis	Molluscs from Spain
H. Dekker	Paratypes of Nassariidae
A. Dotan	Marine molluscs from Angola
W.J. Eyerdam	Land snails from North and South America (1930-1950)
T. Feldstein	Land snails and marine molluscs from Israel
F. Fuchs	Land snails from Israel
B. Galil	Marine molluscs Eastern Mediterranean
J. Gerritzen	Land snails from southern France
J.T. Gerritzen-Mienis	Shell belt from Thailand
I. Gevah	Marine molluscs Red Sea
S. Gevah	Marine molluscs Red Sea
D. Golani	Marine molluscs Eastern Mediterranean
H. Hageman	Land snails from the Netherlands
L. Hászlein	Land snails from Germany
S. Israeli	Land snails from Israel

M. Katz	Land snails from Israel
F. Käufel	Land snails from Austria
O. Kolodny	Land snails from Israel and Crete
H.H. Kool	Paratypes of Nassariidae
L. Meerema	Land snails from southern France and Israel
H.K. Mienis	Molluscs from Israel and the Netherlands
D. Mienis	Land snails from Israel
D. Milstein	Freshwater snails Israel
A. & N. Na'eh	Land snails from Israel
R. Ortal	Freshwater snails Israel
N.D. Paschall	Marine molluscs from Florida and the Bahamas
I. Pieck	Land snail from Israel
I. Renan	Land snails from Israel
O. Rittner	Land and freshwater molluscs from Israel and Argentina
Shalmon	Land snails from Israel
A. Shmida	Land snails from Israel and Jordan
B.S. Singer	Marine molluscs Red Sea
R. Tsadok	Marine molluscs Eastern Mediterranean
S. Vaisman	Land snails from Israel and the Netherlands, freshwater molluscs from Thailand
M. Volokita	Land snails from India

Type Material

A list of type specimens present in the Mollusc Collection has been published in previous reports (Mienis, 2010, 2011, 2012 & 2013). 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:

Recent donations

Received from Prof. Ofer Bar-Yosef:

Bourguignat, J.R., 1853-1856. Aménités Malacologiques. Tome Premier, 255 pp., 21 pls. J.B. Baillièrre, Libraire, Paris

Received from Dr. Menachem Goren:

Ibrahim, A. M., Bishai, H.M. & Khalil, M.T., 1999. Freshwater Molluscs of Egypt. Publication of National Biodiversity Unit, 10: 145 pp. Cairo, Egypt

Received from Dr. Siong Kiat Tan:

Tan, S.K., Chan, S.Y. & Clements, G.R., 2012:

A guide to snails and other non-marine mollusks of Singapore. 169 pp.

Science Centre, Singapore.

Received from Dr. K.A. Lutaenko:

Lutaenko, K.A. & Noseworthy, R.G., 2012, Catalogue of the living bivalvia of the continental coast of the Sea of Japan (East Sea). 248 pp. Dalnauka, Vladivostok.

Received from Henk K. Mienis:

Clayton, J.M., 1977. Schelpen [Original title: All color book of seashells.] 72 pp. Amsterdam Boek B.V., Amsterdam.

Copland, J.W. & Lucas, J.S. (Eds.), 1988. Giant Clams in Asia and the Pacific. 274 pp. Australian Centre for International Agricultural Research, Canberra.

Pascoe, A., n.d. Sea-Shells on Cornwall's beaches. 36 pp. Tor Mark Press, Truro.

Romashko, S., 1992. The Shell Book. 6th Ed. 64 pp. Windward Publishing, Minneapolis.

Tisdell, C. (Ed.), 1992. Giant Clams in the sustainable development of the South Pacific. 275 pp. Australian Centre for International Agricultural Research, Canberra.

New acquisitions

Welter-Schultes, F., 2012. European non-marine molluscs, a guide for species identification, 679 pp., 78 plts. Planet Poster Editions, Göttingen.

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.

**Fourth addition to the catalogue of type specimens in the mollusc collection
of the tel aviv university**

Henk K. Mienis

Type material of 16 taxa is added to the provisional lists of type specimens present in the Mollusc Collection of the Steinhardt National Collections of Natural History, the Tel Aviv University (Mienis, 2010, 2011, 2012 and 2013). One type sample was found in the collection Zvi Orlin, while the other type samples were donated to the Mollusc Collection during the academic year 2012/13.

GASTROPODA

Family Trochidae

Gibbula barbara Monterosato, 1884

Syntype TAU MO 78285: Costa di Barberia (=Barbary coast, North Africa [=Morocco-Tunesia]).

Family Skeneidae

Skenea nilarum Engl, 1996

Paratype TAU MO 78230: Spain, Canary Islands, Lanzarote, Puerta del Carmen, 46-50 m depth.

Family Cyclophoridae

Alycaeus damsangensis Godwin-Austen, 1886

Syntypes TAU MO 78228/3: Western Bhutan Hills, Damsang Peak.

Family Diplommatinidae

Diancta diepenheimi Preston, 1913

Syntype TAU MO 78227: Indonesia, Beilan-Beilan Islet, north of Grand Obi.

Diplommatina frumentum Preston, 1914

Syntype TAU MO 78226: India, Assam, Naga Hills.

Diplommatina homeii Godwin-Austen, 1876

Syntype TAU MO 78267: India, Assam, Dafla Hills, Shengorh Peak.

Family Nassariidae

Nassarius jeanmartini Kool and Dekker, 2006

Paratype TAU MO 77648: Reunion Island, W-coast, Bay of Saint Paul, in muddy black sand.

Nassarius zanzibarensis Kool and Dekker, 2007

Paratype TAU MO 77647: Tanzania, Zanzibar Island, E-coast Uroa, Tamarind Beach H, in sand with sea grass at low tide.

Family Mangeliidae

Eucithara gevahi Singer, 2012

Paratypes TAU MO 76666/2: Israel, Red Sea, Gulf of Aqaba, Elat, beach of the "small boat harbour".

Family Oxychilidae

Vitrea hibernica Kennard, 1907

Syntypes TAU MO 78311/3. Ireland, Co. Antrim, Murlough Bay.

Remark: Although described in the genus *Vitrea*, now family Pristilomatidae, it is clearly an *Oxychilus* species, family Oxychilidae.

Vitrea rogersi Woodward, 1903

Syntypes TAU MO 78312/3. England, Cheshire, Marple Wood.

Remark: See previous species.

Family Urocoptidae

Urocoptis delectabilis florenciana Pilsbry, 1929

Paratype TAU MO 78313 Cuba, south slope of ridge, north of Florencia, on large rocks in humid forest near the summit of the ridge.

Remark: This taxon had been mentioned and figured but not described several months earlier by Pilsbry (1928: 80) as *Urocoptis delectabilis florentiana* (sic!) in the text, and correctly as *Urocoptis delectabilis florenciana* on plate 5, fig. 9.

Urocoptis livida atkinsi de la Torre and Clench, 1930

Paratype TAU MO 78286: Cuba, Cienfuegos, Central Soledad, Vilches Potrero.

Family Streptaxidae

Ennea copiosa Preston, 1913

Syntypes TAU MO 78284/2: British East Africa (=Northern Kenya), Mount Urguess.

Ennea woodhousei Preston, 1913

Syntypes TAU MO 78283/2: Uganda, Mount Elgon.

Family Hygromiidae

Xerophila boiteli Pallary, 1920

Syntype TAU MO 78229: Morocco, Ksabi.

Acknowledgements

Thanks are due to Zvi Orlin (Qiriyat Motzkin), Benjamin (Solly) Singer (Rehovot), Hugo H. Kool (Dieren, the Netherlands) and Henk Dekker (Winkel, the Netherlands) for the donation of the type samples to the Mollusc Collection of the Steinhardt National Collections of Natural History.

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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

Moshe Gershon

Israel: Several dozens of collecting trips to more than 180 collecting sites were made along the year. Collecting methods included net sweeping, light and Malaise traps, as well as direct rearing from host plants. Overall, more than 15,000 insect specimens from different orders were collected (based on the digitized database).

Special and ongoing projects: a survey of Cynipidae (gallwasps) from all Israeli oaks (*Quercus*); a survey of gall midges of the genera *Rhopalomyia* and *Ozirhincus* from Asteraceae host plants, and a survey of predatory gall midges in agricultural settings throughout the country.

Abroad:

- Netta Dorchin (together with a PhD student) – participation in the 6th International Symposium on Gall-Inducing Arthropods in Australia.
- Amnon Freidberg - collecting trips to Vietnam, Thailand, Papua New Guinea, Kenya, Ethiopia, Cameroon. Survey for African Tephritidae (Diptera).

- Dan Gerling – collecting trip to Ethiopia, one week of collection starting September 2012 Nur Ura and Addis Abbaba. Survey for hosts of *Africaleurodes coffeaecola* (Homoptera).
- Sergei Zonstein – work at the Natural History Museums in Finland and Belgium (Arachnidae).
- Vasiliy Kravchenko – collecting trips to Mali and Turkey. Survey of Noctuidae (Lepidoptera).
- Zoya Efremova – work at the Natural History Museum in London on parasitic Hymenoptera.
- Efrat Gavish-Regev – work at the Natural History Museum of Denmark; Conference in China
- Ahik Dorchin – work on Christophe Praz's bee collection in the University of Neuchatel, Switzerland; A revision of *Megachile* (Hymenoptera)
- Leonid Friedman – collecting trip to Papua New Guinea; Survey of Curculionidae and other beetles (Coleoptera).
- Liz Morgulis – collecting trip to Ethiopia and Cameroon; survey of Tephritidae (Diptera).

The collection of insects during my sabbatical

Amnon Freidberg

In October 2012 I began an 11-month sabbatical, specifically designed for collecting fruit flies (Tephritidae), other flies (Diptera) and other insects in tropical countries. The time was more or less equally divided between the Oriental + Pacific regions and the Afrotropical region. I first flew to Hanoi where I met Dr. Hong Thai Pham, a local entomologist, and an old friend, Dr. Damir Kovac, from the Senckenberg Museum, Frankfurt. Pham acted as our efficient, kind and knowledgeable guide during our excursion in central Vietnam. Collecting was generally rather poor, and the most impressive insects I saw were lantern flies (Homoptera: Fulgoridae), large (3-4 cm in length),

bizarre, cicada-like insects observed resting on tree trunks. After Pham had shown them to me, and after several failed attempts, due to them being extremely quick fliers, I was able to catch several specimens. The other group that impressed me was that of the extremely diverse butterflies that practically dominated the landscape (to the extent that they almost replaced the birds...).



A female bamboo fly (Tephritidae: Gastrozonina: Paraxarnuta sp.) riding a female weevils in wait for using the oviposition holes made by the weevil for the fly own needs for oviposition (Courtesy D. Kovac)

After a pleasant week in Vietnam, Damir and I moved on to Thailand, where we intended to focus our efforts on the biological and taxonomic study of bamboo fruit flies. We were based in the “Little Eden” guesthouse, where Damir already had a long-term and excellent relationship with the owner (Ms. Pemm). This guesthouse was in a small village, Soppong, in north-west Thailand, and Damir has been coming here once or twice a year for the last few decades. He was very familiar with the entire area, which was a great advantage for me. Collecting was moderately good, and I managed to collect and rear several fruit fly species that I had never collected before. One of these, *Pararhabdochaeta*, belongs to the only genus of the tropical fruit fly tribe Schistopterini that I have never previously collected. This was both exciting and important, as my current Ph.D. student, Liat Gidron, will be able to use these specimens for a cladistic analysis of this tribe that she has been conducting as

part of our world revision of the tribe. Another interesting finding was that of numerous fly specimens of the family Neurochaetidae (“upside-down flies”), which were swept from banana plants. The adults of these flies behave in a rather peculiar way, earning them this peculiar name, spending hours on a small vertical section of the plant running fast and for long periods in all directions, always with their head pointing down. This small family is best represented on Madagascar (about 10 species), and there are about five additional species in the Oriental and Australasian regions. It has never before been reported from northern Thailand.

One of the main goals of working in Thailand was to collect and preserve in alcohol as great a diversity of bamboo flies (Tephritidae: Gastrozonini and Acanthonevrini) as possible. Bamboo flies are relatively large and colorful fruit flies, and it's always a great pleasure working on them both for scientific and esthetic reasons. Along with other material we'll use the freshly collected specimens for reconstructing the phylogeny of these groups using molecular techniques. In this respect, we did moderately well.

After about one month in Thailand I moved to PNG (Papua New Guinea) for two months. The island of New Guinea is supposed to be a haven for both birds of paradise (which I heard but was never lucky enough to see) and Tephritoidea flies, the group that contains the fruit flies and several other families, such as the Platystomatidae. I was invited to work in PNG in cooperation with the agricultural organization NARI (National Agricultural Research Institute), and my host there was Dr. Sim Sar, a high-ranking manager in the Institute. I was based at the NARI station in Lae (the second largest city in PNG, after Port Moresby, the capital), staying at their very pleasant and convenient guesthouse. I collected much material at the research station and within a radius of about 50 km, and made several excursions to more remote places as well as visiting the main insect collection in the Kila Kila NARI station on the outskirts of “Moresby” (as called by the locals). New Guinea is a huge island, and PNG

alone (the island is divided about equally between Irian Jaya (Indonesia) and PNG) is about 23 times as large as Israel. My main long-distance excursions were to Mt. Hagen (by air), Bulolo (by vehicle), Madang area (by vehicle), and Moresby (by air). The latter trip had to be made by air, since these two large cities are not connected by any roads. This is only one of many peculiarities of this interesting country. During the two months I spent there I twice received visitors, with some overlap between them. The first visitors were my South-Korean colleague Prof. Ho Yeon Han, a molecular biologist with whom I have long been cooperating, and his assistant, Sang-Wook Suk. They were interested in the same groups that I was, and with the same priorities. The second visit was by Leonid Friedman, of this museum, a coleopterist (beetle expert) who specializes in weevils (Curculionoidea). We spent an excellent time together, and Leonid managed to catch a nice male specimen of *Achias rothschildi*, an unusual platystomatid fly in which the male bears its eyes on long stalks (actually, prolongations of the head). The “eye-stalk span” of this male was over five centimeters, making this species one of the largest flies in the world, at least when measured linearly. While in PNG it was impossible for me not to notice the widespread and immense love and appreciation for Israel among all sectors of the population. Nonetheless, the pleasant time we spent on this interesting island did not guarantee a happy end. NARI failed to issue export permits for us, and about 10,000 pinned insect specimens had to be left in Kila Kila, with no way of knowing for how long.



Achias rothschildi, Prof. Ho-Yeon Han, Yunesi University, Korea

The remaining time was devoted to Africa, and my base there was in Nairobi. I made two excursions abroad: one for about two weeks to Ethiopia, and another,

also about two weeks, to Cameroon. On both excursions I met up with my Ph.D. student, Elizabeth (Liz) Morgulis, at the destination, and during the fieldwork in Cameroon we also had with us Dr. Ashley Kirk-Spriggs, a dipterist from Bloemfontein, South Africa. These two excursions were designed to meet Liz's needs for her project: a revision of *Tephritomyia* and *Acanthiophilus*, two primarily Afrotropical genera of fruitflies. During the periods between these excursions I made several shorter trips across much of Kenya, sampling the great diversity over many regions and habitats as well as across the changing seasons. My base in Kenya was in Muthaiga North, on the northern outskirts of Nairobi, in the middle of some extensive open areas. I was hosted by Robert (Bob) Copeland and Juliet Muriuki, who kindly invited me to stay in their home. Their patience and advice were indispensable, and we have remained good friends despite my prolonged stay with them. Collecting in Muthaiga North was the highlight of my sabbatical, specifically sampling the high diversity and sensing nature at its best, right inside the rich semi-urban habitats. I would take my net and killing jars, a small bottle of water and an apple, step out of the residential quarter, and after several minutes of walking was able to collect several species unknown as yet to science. I would roam the open expanses, at one with nature, mentally and physically. The collected material is still being processed, so at present I can only estimate the diversity of fruit flies in this neighborhood, which is ca. 100 species, comparable with the entire Israeli fauna of this group.

Liz's revision, mentioned above, deals with two little studied genera. My previous collections in Africa had indicated that a much larger fauna exists on this continent, almost certainly including a good number of new (undescribed) species. During our excursions we made an effort to sample this fauna intensively and extensively, to obtain fresh material for molecular studies, and to become acquainted with the biology and immature stages (e.g., the larvae) of as many species as possible. With regard to these genera, although Ethiopia proved to be much richer than Cameroon, the combined work and achievements

in these two remote countries was extremely successful. For example, the two genera jointly as known to us now comprise 13 named (“old”) species plus about 26 undescribed (“new”) species, with all but five species being strictly Afrotropical.

In summary, although this sabbatical was not easy, in more ways than one, it gave me a unique opportunity for prolonged excursions and fieldwork to the extent that I have never previously had. My companions from TAUI and I collected and mounted (although not all the beetles have been mounted yet) approximately 20,000 specimens of scores of species, many of which are new to science. This material will soon provide work for many taxonomists around the globe.

Numerous, endangered and neglected: Biodiversity survey of threatened Israeli reptiles

Shai Meiri

Malacological fieldwork mainly dealing with land and freshwater molluscs has been carried out occasionally by the authors during the academic year 2012-2013. The most important results are briefly mentioned here.

We have surveyed 18 regions in Israel over the course of 13 months (3 April to 01 May 2013). Survey methods included visual inspection, and overturning of rocks and other possible shelters. Mostly only day searches were conducted, but in some areas we also surveyed at night (Negev sands, Ein Gedi, etc.). We observed specimens belonging to 62 (59 squamates, 3 tortoises) of the 89 extant species in Israel in 14 reptile families. These represent approximately 70% of the known Israeli terrestrial-reptile species. The great majority of these individuals were lizards (85%), and only 9% were snakes and 6% turtles. No rhynchocephalians, crocodiles or amphisbaenians were seen, although,

admittedly, searches concentrated only on the latter (but no pitfalls were used), and temperatures were probably too high for the former even if biogeographic barriers were overcome.

Some 288 specimens (mostly only tail tip samples, without vouchers) entered the Tel Aviv museum. Of these 207 were genetically sampled. We already received requests to genetically sample some of these species (e.g., *Ablepharus rueppellii*, *Mediodactylus amictopholis*, *M. kotschy*, *Mesalina guttulata*, *Hemidactylus turcicus*, *Trapelus mutabilis* etc.) from scientists abroad.

We found no reptiles in localities we did not expect to find them, except in one case, where a specimen of Rueppell's snake-eyed skink (חרומט גמדי), *Ablepharus rueppellii* was collected near Shivta junction, 25 km away from its nearest known locality. This has led us to write a paper on the distribution of this species in Israel and abroad (Roll et al., 2013). A putative *Micrelaps tchernovi* seen, but not collected, in the Hermon field school may represent a larger range extension; we are now looking into this issue.

Three papers resulted, so far, directly from the survey (Roll et al. 2013, Tamar et al. 2013a, 2013b). Data were also used in more broad-scope papers (Meiri et al., 2013, Pincheira-Donoso and Meiri, 2013).

Malacological fieldwork in Israel

Henk K. Mienis and Oz Rittner

Malacological fieldwork mainly dealing with land and freshwater molluscs has been carried out occasionally by the authors during the academic year 2012-2013. The most important results are briefly mentioned here.

16 November 2012: North bank of the Yarqon

The north bank of the Yarqon River west of the Ayalon Highway was investigated for the presence of living specimens of the Mouse-eared snail *Phytia myosotis*. This amphibious marine snail had not been collected in the Yarqon since the cleaning up of that river in the last decennia of the 20th Century. Fair numbers of this interesting species were found under Sea purslane *Halimione portulacoides* just above the water edge, where the soil was still wet.

In addition two soil samples were taken from as many different areas between the Yarqon River and the Rokach Road. These samples were screened for the presence of land snails by Mrs. Svetlana Vaisman of the Department of Plant Protection and Inspection Services, Ministry of Agriculture, Bet Dagan. This resulted in the finds of the following eight species: *Euchondrus septemdentatus*, *Hawaiiia minuscula*, *Caracollina lenticula*, *Microxeromagna lowei*, *Monacha syriaca*, *Prietocella barbara*, *Xeropicta vestalis joppensis* and *Theba pisana*, of these *Hawaiiia minuscula* and *Prietocella barbara* are invasive, exotic species.

4 December 2012 Atlit, Horbat Qarta, Nahal Oren and Nahal Tanninim

The former saltpans of Atlit were investigated for the presence of *Phytia myosotis*, but only a few empty shells were found. The following marine species were collected: *Osilinus articulatus*, unidentified Hydrobiid, *Pirenella conica*, *Brachidontes pharaonis*, unidentified Mytilid, *Cerastoderma glaucum*, *Peronaea planata* and *Abra segmentum*. On the banks of the saltpans five species of land snails were collected:

Euchondrus septemdentatus, *Microxeromagna lowei*, *Monacha syriaca*, *Xeropicta vestalis joppensis* and *Helix engaddensis engaddensis*.

At Horbat Qarta near the Atlit saltpans a land snail survey was carried out. In addition also a litter sample was taken, which was checked for the presence of snails by Svetlana Vaisman. The following 12 species were collected: *Truncatellina haasi*, *Granopupa granum*, *Euchondrus saulcyi*, *Euchondrus septemdentatus*, *Paramastus episomus*, *Eopolita protensa jebusitica*, *Deroceras*

berytensis, *Sphincterochila cariosa*, *Monacha syriaca*, *Xeropicta vestalis joppensis*, *Helix engaddensis engaddensis* and *Levantina spiriplana caesareana*. A report was published in the "Tentacle", the Newsletter of the IUCN/SSC Mollusc Specialist Group (Mienis, Rittner and Vaisman, 2013).

The north facing slope of the exit of Nahal Oren was briefly surveyed for the presence of terrestrial snails and slugs. Ten species were collected for permanent preservation: *Pomatias olivieri*, *Pilorcula raymondi hebraica*, *Euchondrus saulcyi*, *Cecilioides acicula*, *Daudebardia saulcyi*, *Eopolita protensa jebusitica*, *Deroceras berytensis*, *Metafruticicola fourousi*, *Monacha syriaca* and *Xeropicta vestalis joppensis*.

The lower, southern part of Nahal Taninim yielded only five species of gastropods: *Pyrgophorus* species, *Pseudoplotia scabra*, *Haitia acuta*, *Pseudosuccinea columella* and *Phytia myosotis*. The latter was found above the water edge. All the true aquatic snails are invasive, exotic species! A short report about them appeared in the "Tentacle" (Mienis and Rittner, 2013).

5 March 2013: Hula Nature Reserve

Participants: Dana Milstein (INNPA), Revital Ben-David Zaslow, Oz Rittner and Henk Mienis.

A total of 14 stations were briefly sampled. Each station is followed by the species which were encountered alive:

Station 1: A tiny round pond with water lilies near the entrance of the Nature Reserve: *Haitia acuta* and *Planorbella duryi*;

Station 2: Canal behind the shelter: *Bithynia phialensis*, *Valvata saulcyi* and *Haitia acuta*.

Station 3: Pond near the shelter garden: *Bithynia phialensis*, *Haitia acuta* and *Pseudosuccinea columella*

Station 4: Shosh pond (large): *Bithynia phialensis*, *Haitia acuta* and *Pseudosuccinea columella*.

Station 5: Entrance of the canal into the lake near the beginning of the visitor's path: *Bithynia phialensis*, *Valvata saulcyi*, *Haitia acuta*, *Pseudosuccinea columella* and *Oxyloma elegans*.

Station 6: New supply canal of the lake: Nothing alive.

Station 7: Exit of the Western Pond: *Bithynia phialensis*, *Valvata saulcyi*, *Haitia acuta* and *Oxyloma elegans*.
Station 8: Entrance to the reservoir: *Bithynia phialensis*, *Valvata saulcyi* and *Haitia acuta*.
Station 9: Migdal Ram, lake east of the tower: *Bithynia phialensis*, *Valvata saulcyi*, *Haitia acuta*, *Ferrissia clessiniana*, *Planorbis planorbis antiochianus* and *Pseudosuccinea columella*
Station 10: Migdal Ram, Saduq, west of the tower: *Bithynia phialensis*, *Haitia acuta* and *Stagnicola palustris*.
Station 11: Saduq, northern bank: *Haitia acuta*, *Ferrissia clessiniana*, *Stagnicola palustris*, *Oxyloma elegans*.
Station 12: "Berekh" of Nahal Eynan: *Bithynia phialensis*, *Melanopsis buccinoidea*, *Melanopsis costata*, *Valvata saulcyi*, *Haitia acuta* and *Stagnicola palustris*.
Station 13: Central pool in Nahal Eynan: *Bithynia phialensis*, *Valvata saulcyi*, *Haitia acuta*, *Ferrissia clessiniana* and *Pseudosuccinea columella*.
Station 14: Source of Nahal Eynan: *Bithynia phialensis* and *Haitia acuta*.

The following eleven aquatic or amphibious species were encountered alive during the survey: *Bithynia phialensis*, *Melanopsis buccinoidea*, *Melanopsis costata*, *Valvata saulcyi*, *Haitia acuta*, *Ferrissia clessiniana*, *Planorbella duryi*, *Planorbis planorbis antiochianus*, *Pseudosuccinea columella*, *Stagnicola palustris* and *Oxyloma elegans*.

Three species: *Haitia acuta*, *Planorbella duryi* and *Pseudosuccinea columella*, are invasive, exotic species of North-American origin. The cap-like snail *Ferrissia clessiniana* is a so-called Nilotic species which most probably reached Israel in the fifties by means of aerial distribution while adhering to the elytra of aquatic beetles or large bugs. *Oxyloma elegans* is an amphibious land snail. Noteworthy is the complete absence of any mussel species (*Unio*, *Potomida*, *Corbicula*, *Musculium* and *Pisidium*). Likewise not a single *Theodoxus* specimen was found alive.

An extended preliminary report dealing with this survey has been submitted to the Israel Nature and National Parks Protection Authority (Rittner and Mienis, 2013).

12 March 2013 Gezer Regional Council

Between Mishmar Ayyalon and 'En Vered: *Euchondrus septemdentatus*, *Calaxis hierosolymarum*, *Microxeromagna lowei*, *Monacha syriaca*, *Xeropicta vestalis joppensis* and *Levantina spiriplana hierosolyma*.

'En Vered: *Haitia acuta*.

19 March 2013 Northern Arava and southern Dead Sea

Tiny spring west of 'En Plutit (west of Ne'ot HaKikar): *Theodoxus michonii* and *Melanopsis buccinoidea*.

Mishor Yamin south of the industrial zone: *Sphincterochila zonata zonata*, *Xerocrassa seetzenii seetzenii* and *Helix engaddensis engaddensis*.

Ma'ale Zafir: *Sphincterochila prophetarum*, *Sphincterochila zonata zonata*, *Hygromiid*. *Unidentified*, *Xerocrassa seetzenii seetzenii* and *Xerocrassa tuberculosa*.

Ma'ale Aqrabim: *Sphincterochila prophetarum*, *Xerocrassa seetzenii seetzenii*; *Xerocrassa species*, *Xeropicta species* and *Levantina spiriplana lithophaga*.

S.E. Dimona: *Sphincterochila zonata zonata*, *Xerocrassa seetzenii seetzenii*, *Eremina desertorum* and *Helix engaddensis engaddensis*.

11 April 2013 Ramat Gan

Gardens in streets east of Herzl Street in Ramat Gan were checked for the supposed presence of *Rumina saharica*, an invasive species. Large populations were indeed located in the following streets: Abtalion, Ma'ale HaNesher, Sion, Moshe Sharet, Elimelekh, HaHayal HaAlmoni and Sderot HaGiborim. During the rainy season 2013/4 we will continue this investigation.

Acknowledgement

We like to thank Mrs. Svetlana Vaisman (Plant Protection and Inspection Services, Ministry of Agriculture, Bet Dagan) for carrying out the picking of the molluscs from the collected soil and litter samples.

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Malacological fieldwork in the Netherlands

Henk K. Mienis

Between 4 September and 6 October 2013 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 former brackish water lake caused by an ancient dike collapse on the island Terschelling;
- b. A terrestrial mollusc survey of the "Nollekes", a former garbage dump turned into an open air theatre on Terschelling;
- c. A first survey of the terrestrial mollusc fauna of the "Herema State" in Joure, an ancient estate of which the large park is still preserved.

North-Holland:

- d. A follow up survey of the Jewish cemetery in Monnickendam for the presence of terrestrial snails and slugs;

- e. A search for new localities of *Hygromia cinctella*, an invasive land snail;
- f. A further survey of the presence of freshwater molluscs near the inundation sluice in South-East-Beemster;
- g. A survey of the freshwater mollusc fauna of the Lighthouse Island near Durgerdam;
- h. A first survey of the terrestrial mollusc fauna of an abandoned railroad track in IJmuiden.

Results

Field work in the province Friesland.

- a. Formerumerwiel, Terschelling.

Ten species of (semi-)aquatic species had been reported so far from this lake (Mienis, 2013a-b). On 25.09.2013 I carried out a brief survey of this large water pool which is supposed to contain brackish water. Due to the long hot and extremely dry summer the water level had been reduced considerably while the water was coloured greenish because of an apparent bloom of microscopic algae. Yet eight species of snails were encountered among them *Succinea putris*, a semi-aquatic species not recorded before from the Formerumerwiel. Eleven species are now known from this area, which is slowly but steadily losing its character of a brackish water pool not only according to the encountered molluscs but also by the discovery of a water scorpion *Nepa cinerea*.

- b. A terrestrial mollusk survey of the "Nollekes", Terschelling.

The "Nollekes" was until 1990 an official garbage dump in the dunes east of Halfweg. In the years 2009-2010 it was covered by 40.000 m³ of soil taken from valleys in its vicinity and transferred into an open air theatre. The top of this artificial hill protrudes over the surrounding dunes; the latter are covered mainly by pine trees. The area is grazed by sheep in order to reduce the height of the plant cover. In the autumn of 2012 I had briefly visited this extremely dry site, which resulted in the discovery of eight species of snails and two species of slugs. On 18.09.2013 I was able to register three additional species of

gastropods. The following 13 species are now known from the "Nollekes": *Oxyloma elegans*, *Succinea putris*, *Vallonia costata*, *Vallonia excentrica*, *Discus rotundatus*, *Aegopinella nitidula*, *Nesovitrea hammonis*, *Deroceras reticulatum*, *Arion rufus*, *Monacha cantiana*, *Trochulus hispidus*, *Cepaea nemoralis* and *Cornu aspersum*. The hygrophilous *Oxyloma* species was found near a tiny artificial watering place for the sheep. *Monacha*, *Cepaea* and *Cornu* have to be considered as invasive species on Terschelling. At the "Nollekes" these three larger species are predated upon by the Song thrush *Turdus philomelos* and most probably also by the carrion beetle *Phosphuga atrata*, a well-known snail predator of which several specimens were found on the "Nollekes".

c. Terrestrial molluscs of the Herema State in Joure.

A brief survey of the park belonging to the Herema State, a former estate in the centre of Joure, for the presence of terrestrial gastropods resulted in the registration of 20 different species: 14 species of snails and 6 species of slugs. Most interesting were the finds of one specimen each of *Tandonia sowerbyi* and *Lehmannia valentiana*, two invasive slugs not recorded before from the province of Friesland in general and Joure in particular.

No trace was found of the Roman snail *Helix pomatia* which had still been found in the garden of Herema State by Butot (1970) more than 40 years ago.

Fieldwork in the province North-Holland.

d. The Jewish cemetery in Monnickendam.

Previous investigations of the terrestrial mollusc fauna of the Jewish cemetery in Monnickendam resulted in the registration of 22 species: 15 snails and 7 slugs (Mienis, 2012b & 2013c). On 12.09.2013 only 14 species were seen but one among them *Arion circumscriptus* turned out to be new for this tiny historic graveyard.

e. New localities of the invasive land snail *Hygromia cinctella*.

The following eight localities in North-Holland are new for the Girdled snail *Hygromia cinctella*, a highly invasive species of Mediterranean origin:

Amsterdam, Buitenveldert, corner Brittenburg and Teilingen, on the leave of trees;

Amsterdam, Buitenveldert, Zuid-Hollandstraat, on the leaves of shrubs;

Amsterdam, Buitenveldert, Zeelandstraat, on the leaves of shrubs;

Amsterdam, Centrum, J.W. Siebbeleshof, courtyard, on garden plants;

Velsen, IJmuiden, along the abandoned railway track off Leeuweriklaan on the leaves of Blackberries *Rubus* species and other shrubs and trees;

Edam-Volendam, Edam, Coen de Koninglaan, on plants in at least four gardens;

Zeevang, Middellie, Kievitstraat, on leaves of Blackberries *Rubus* species;

Beemster, South-East Beemster, Zuiderweg, on plants in garden.

The records for IJmuiden, Edam and Middellie are new for these towns *c.q.* villages.

f. Freshwater molluscs from the inundation sluice in South-East-Beemster; Only one freshwater snail: *Galba truncatula*, had so far been recorded from the inundation sluice in South-East-Beemster (Mienis, 2012a & 2013d). This was due to the fact that the non-public part of the site: a small lake with a floor and banks consisting of neatly arranged basalt blocks could not be sampled. On 01.10.2013 I had an opportunity to carry out a short survey of that lake. Although the results were rather disappointing, seven species of freshwater snails could be registered: *Bithynia leachii*, *Bithynia tentaculata*, *Valvata piscinalis*, *Acroloxus lacustris*, *Stagnicola palustris*, *Anisus vortex* and *Gyraulus albus*. This brings to 37 the number of molluscs known to live in the area of this inundation sluice.

g. Freshwater molluscs of the Lighthouse Island near Durgerdam. Previous investigations carried out on the Lighthouse Island near Durgerdam revealed the presence of three species of freshwater gastropods in a tiny artificial pond on the island, seven different species (4 gastropods and 3 bivalves) on or between the basalt stones forming the banks all around this artificial island and two semi-aquatic snails on the vegetation near the banks (Mienis, 2012c & 2013). On 06.09.2013 I had the opportunity to visit again this

normally closed area. This time I looked only for freshwater molluscs. This resulted in the find of eight additional species: four snails (*Bithynia tentaculata*, *Haitia acuta*, *Galba truncatula* and *Gyraulus albus*) and as many bivalves (*Anodonta cygnea*, *Pseudanodonta complanata*, *Unio pictorum* and *Unio tumidus*). This brings to 46 the number of molluscs known from the Lighthouse Island.

h. Terrestrial molluscs from an abandoned railroad track in IJmuiden.

Railroad tracks form often excellent floristic and faunistic habitats (Koster, 1991) even more so if these railroad tracks are abandoned. Such a situation is at the moment still present in IJmuiden where a railroad which connected the important fishing harbour with the rest of the country became in disuse and was even closed altogether. This abandoned railroad track is about 5 km long, of which half is running in a south-north direction and the other half in an east-west direction. The south-north track is overgrown by shrubs and trees, while the east-west track has remained much more open with large patches covered by grass. On 30.09.2013 I had the opportunity to investigate briefly part of both tracks. The full results will be published elsewhere, here I will list only the names of the 17 species, which were encountered: *Cochlicopa lubrica*, *Discus rotundatus*, *Oxychilus draparnaudi*, *Boettgerilla pallens* (under a log), *Limax maximus* (two specimens under the same log), *Deroceras invadens* (better known as *D. panormitanum* auct.), *Deroceras reticulatum*, *Arion rufus*, *Candidula gigaxii*, *Candidula intersecta*, *Cerņuella cisalpina*, *Cerņuella virgata*, *Hygromia cinctella*, *Monacha cantiana*, *Cepaea nemoralis*, *Cornu aspersum* and *Helix pomatia*.

Sun-loving species belonging to the genera *Candidula* and *Cerņuella* were only found along the EW-track. Tiny species are missing due to the fact that I did not collect soil and litter samples. Therefore I do not rule out the possibility that at the moment I have collected approximately 50% of all the species which are actually living on this abandoned railway track. Noteworthy is still the presence

of *Helix pomatia*, a species protected by law in the Netherlands (de Bruyne *et al.*, 2003).

The fieldwork in the Netherlands was 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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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. 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 2012-2013 was more than 9,000 people, of which 66% were school children, 3% were families and private groups, 21% were adults and the rest were various groups.
- b. Adults visitation continued to grow. During 2012-2013 we had groups 930 students from other than TAU higher education institutions. We also hosted in-service professional training to the guides of the Society for the Protection of Nature in Israel and for the rangers of the Nature and Parks Authority.
- c. Spaceship Earth Hanuka, Passover and summer camps huge success expanded beyond our traditional audience of children and grandchildren of TAU employees with cooperation with Tovanot Ba'Hinuch organization, which brought 100 children from underprivileged neighborhoods to our science camps during the summer.
- d. In addition to our usual visitors, we enjoyed over 27,200 unique visitors to Nature Campus website, a growth of 26% compared to previous year; over 26,700 unique visitors to EarthWeb (our natural resources website),

a growth of 72% compared to previous year; and over 11,700 to the Collections website, a growth of 20% compared to previous year.

2. 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; Shevy Rothman, fish parasites.

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

2013/14: Zohar Yannai, dragonflies and damselflies; Yaarit Levitt, Decapod crustaceans.

M.Sc. Scholarships:

2012/13: Igor Armiach, spiders; Shlomi Aharon, spiders.

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.

2013/14: Achik Dorchin, eucerine bees.

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 and Dorothee Huchon, Ctenophores; Leonid Friedman, Red Weevils; Netta Dorchin and Zvi Mendel, midges; Sigal Shefer, Tamar Feldstein and Micha Ilan, demosponges; Ehud Spanier and Jason Goldstein, decapods; Yossi Loya, Mesophotic corals.
- 2013/14: Elad Chiel, housefly parasitoids; Eric Palevsky, soil dwelling predatory mites; Guy Yehuda and Ofer Ovadia, Charopytes; Shlomi Aharon and Yael Lubin, spiders in caves; Netta Dorchin and Tatyana Novoselsky, lace bugs; Razy Hoffman, seaweeds and seagrasses; Gil Koplovitz and Noa Shenkar, ascidians.

Overseas training for students:

- 2010/11: Karin Tamar, reptiles; Ittai Renan, beetles.
- 2011/12: Anna Halasz, corals; Achik Dorchin, bees; Ittai Renan, beetles; Rebecca 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; Philip Nemoy, Sponges;

2013/14: Igor Armiach, , spiders; Shlomi Aharon, spiders; Ittai Renan , beetles; Gal Eyal , corals; Elizabeth Morgulis, fruit flies; Einat Shachar, Gall wasps;

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.

2013/14: Edward Ueckermann, Soil dwelling acarine predators; Ms. Gretchen Lambert, Ascidians.

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 2012/2013 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. Abbas, J., Hamoud K, May H, Peled N, Sarig R, Stein D, Alperovitch-Najenson D, HersHKovitz I. 2013. Socioeconomic and physical characteristics of degenerative lumbar spinal stenosis individuals. Spine (Phila Pa 1976).
2. Appeltans et al. (+115 co-authors). 2012. Magnitude of global marine biodiversity: one third of sea creatures discovered. Curr Biol 22:1-14 Highlighted in "Nature Research Highlights" Nature 491:498.
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5. Bar-Yosef Mayer, D. E., 2013, Towards a Typology of Stone Beads in the Neolithic Levant. Journal of Field Archaeology 38(2):129-142. DOI 10.1179/0093469013Z.00000000043
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9. Belmaker J. and Jetz W. 2013. Spatial scaling of functional structure in bird and mammal assemblages. The American Naturalist 181: 464-478.

10. Ben-Ami, F. and Routtu, J. 2013. The expression and evolution of virulence in multiple infections: The role of specificity, relative virulence and relative dose. BMC Evolutionary Biology 13:97 (11 pp.).
11. Benayahu Y. 2013. Notes on some tropical octocorals at the Zoological Museum, University of Copenhagen, Denmark (Cnidaria: Octocorallia). The Raffles Bulletin of Zoology 61:7-11.
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- 2012 Past Populations Predicting the Future of Human Health: the Case of Hyperostosis Frontalis Interna, The 19th European meeting of the Paleopathology association, Lille France (H. May).
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- 2013 Paleoenvironmental conditions during the Bronze and Iron Ages (~5,000-2,500 YBP) in Lake Kinneret area, based on pollen analysis. The Annual Conference of the Israel Geological Society, Akko, Israel, May 2013 (D. Langgut I. Finkelstein, M. Stein, V. Klinger and T. Litt).
- 2013 The eastern Mediterranean: new biota –new food web. Mediterranean Marine Biodiversity in view of climatic change and the invasion of alien species conference (MARBIGEN). Heraklion, Crete, Greece, from 7th – 9th October 2013 (Goren, M., Galil B.S., Diamant A.).
- 2013 The Late Bronze Age Collapse: Paleoenvironmental, Archaeological and Textual Evidence. Annual Meeting of the American Schools of Oriental Research (ASOR), Baltimore, USA, November 2013 (D. Langgut and I. Finkelstein).

- 2013 Utilization of the DNA barcoding tool for fish species from the Levantine basin. Mediterranean Marine Biodiversity in view of climatic change and the invasion of alien species conference (MARBIGEN). Heraklion, Crete, Greece, from 7th – 9th October 2013 (Karahan A., Douek J., Paz G., Stern N., Kideys A., Shaish L., Goren M., Rinkevich B.).
- 2013 8th symposium on the lacertids of the Mediterranean basin, Koper, Slovenia (Meiri, S.)
- 2013 Alien invasive serpulids in the Levant Mediterranean – an update. Program and Abstract Book 11th International Polychaete Conference, Sydney, Australia, 4-9 August 2013: 53 (Ben-Eliahu, M.N., Chipman, A., ten Hove, H.A., Mienis, H.K. and Rilov, G.)
- 2013 ASWA, Arhcaezoology of Southwest Asia, Haifa: Paper presented: Mollusc shell research at Çatalhöyük (D.E. Bar-Yosef Mayer).
- 2013 British Ecological Society Macroecology meeting, Sheffield University, Sheffield, UK. (Meiri, S.).
- 2013 Indigenous and introduced gastropods, and their trematodes: Implications for biodiversity. World Congress of Malacology, Azores, Portugal (Ben-Ami, F.).
- 2013 Israel Geological Society, Annual meeting, Acco, Israel. Paper presented: Neolithic voyages to Cyprus: Possible routes and mechanisms (D.E. Bar-Yosef Mayer).
- 2013 Life history reconstruction from skeletal remains. European Society for Paediatric Endocrinology, Acco/Haifa, Israel (Hershkovitz, I.).
- 2013 New record of parasitoids (Hymenoptera: Braconidae, Eulophidae) of the moth *Phyllonorycter quercifoliella* (Lepidoptera: Gracillariidae) on *Quercus ithaburensis* in Israel. Poster. The conference of the Entomological Society of Israel (Yfremova, Z., W. Kuslitzky and V. Kravchenko).
- 2013 Querying oceanic acidification at the P-Tr transition on the Levant margin sector of the northwestern Gondwanan plate. World summit on p-tr mass extinction & extreme climate change, Wuhan, China (Korngreen D., Bialik O., Orlov-Labkovsky O. and Benjamini C.).
- 2013 Society for American Archaeology, Honolulu, HI. Paper presented: Mud beads: chronology, distribution, composition and symbolism (D.E. Bar-Yosef Mayer).

- 2013 Society for American Archaeology, Honolulu, HI. Symposium co-organizer: Not just for show: The archaeology of beads, beadwork, and personal ornaments (D.E. Bar-Yosef Mayer).
- 2102 Multiannual trends in fishery catch along the Mediterranean coast of Israel. The 49th Conference of the Zoological Society of Israel, Tel Aviv University. 9 December 2012 (Wisman, I., Meiri S. Goren, M.).

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

- 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- Tal Levanony (T. Dayan)
Patterns of biodiversity in natural and cultural landscapes: a model Mediterranean forest ecosystem.
- 2006-2013 Chen Yoffe (Y. Benayahu)
Symbiont transmission in cnidarian hosts: integrated processes and mechanisms determine specificity.
- 2007-2013 Amir Shitenberg (D. Huchon and M. Ilan)
Phylogeny and evolution of demosponges.
- 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.
- 2007-2013 Ido Sella (Y. Benayahu)
Biomaterial from a soft coral

- 2007-2012 Roe Segal (Y. Loya)
Toxicological effects of heavy metals on reef organisms.
- 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- 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 phylogenetic 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).
The influence of invasive Common Myna (*Acridotheres tristis*)
on foraging and nesting behaviors of local *House Sparrow*
(*Passer domesticus*)
- 2011- A. Lavi (M. Ilan)
Interactions within sponge microbial community.
- 2011- Roni Izhar (F. Ben-Ami)
The evolution of virulence under conditions of frequent multiple
infections.
- 2012- Orr Comay (T. Dayan).
Owl pellet taphonomy and the paleoecology of Qesem Cave
- 2012- Or Givan (Belmaker J.)
Commonness and rarity in Mediterranean fishes.
- 2012- Boaz Grous (Langgut D. and O. Lipschits and Y. Gadot)
The Carrying Capacity of Ella Valey during Historical Periods
- 2012- Elizabeth Morgulis (Dorchin, N. and A. Freidberg).
Phylogenetic classification of the genera *Acanthiophilus* Becker
and *Tephritomyia* Hendel (Diptera: Tephritoidea: Tephritidae)
- 2012- Maria Novosolov (S. Meiri and D. Orme).
Global lizard diversity.
- 2012- Einat Shachar (Dorchin, N.).
Taxonomy and Ecology of oak gall wasps in Israel
(Hymenoptera: Cynipidae)
- 2012- Itai van Rijn (Belmaker J.)
The Seasonal growth and mortality in indigenous and invasive
Mediterranean fishes.

- 2012- Bat-sheva (Shevy) Rothman (Goren M.)
The phylogeny of Monogenea (Platyhelminth) fish parasites.
- 2012- Enav Vidan (Belmaker J.)
To be determined.
- 2012- Adam Weissman (Belmaker J.)
To be determined.
- 2012- Mey-Tal Yaniv (Shenkar, N.)
Early detection of non-indigenous ascidians along the Mediterranean coasts of Israel.
- 2013- Gal Eyal (Y. Loya)
Biodiversity of Mesophotic (30-60 m depth) scleractinian corals in the Gulf of Eilat/Aqaba.
- 2013- Lee Eyal- Shacham (Y. Loya)
Legislation of Marine Protected Areas in Israel: Mediterranean and Red Sea Reproductive strategies of deep reef (60 m depth) corals.
- 2013- Yuval Itescu (S. Meiri and P. Pafilis).
Is evolution on islands special? Evolutionary pathways in an island lizard.
- 2013- Sigal Orlansky (F. Ben-Ami)
The costs and benefits of resistance to parasites: The case of *Daphnia similis*.
- 2013- Ya'arit Levitt (Shenkar, N.)
Diversity and spatial distribution of Caridea species along the coasts of Israel.

MSc students

- 2007- Thehila Nagar (M.Goren)
Feeding habits in some freshwater fishes in Israel.
- 2008-2012 Hila Lahav (T. Dayan and A. Hefetz)
Ant communities under different land management practices.

- 2009- Dolev Kastin (M. Goren)
reproductive and growing biology of the cyprinid fish *Garra rufa*.
- 2009-2012 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- 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
- 2010-2013 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.
- 2010-2013 Lee Eyal (Y. Loya)
Legislation of Marine Protected Areas in Israel: Mediterranean and Red Sea Reproductive strategies of deep reef (60 m depth) corals.
- 2010-2012 Yuval Itescu (S. Meiri)
Turtle Macroecology.
- 2010- Yael Mandelberg (Y. Benayahu)
Collagen producing octocorals of the genus *Sarcophyton*.
- 2010-2012 Maria Novosolov (S. Meiri)
Macroecology of island reptiles.
- 2010-2013 Shimon O. (M. Ilan)
Biotechnology of *Chondrosia reniformis* and *Chondrilla nucula*.

- 2010-2013 Zohar Yanai (T. Dayan with A. Gasith)
Alien freshwater Mollusca in Israel - introduction pathways and biological traits.
- 2010-2013 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- Vivian Slone (I. Hershkovitz)
Vertebral hemangiomas.
- 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- Schwartz, I. (M. Ilan)
Ecology and biotechnological application of the Red Sea sponge *Crella cyatopho*.
- 2011- Iris Wiseman (S. Meiri and M. Goren).
Overfishing in Israel.
- 2012- Mark Cavanagh (Langgut, D. and E. Ben Yosef)
Identifying the Wood Fuel that was used for Metalurgical Activity in Timna
- 2013- Yuval Baar (Scharf, I. and S. Meiri).
The effect of climate on body size and shape of insects in Israel.
- 2012- Gilad Danon (Dorchin, N.).
Behavioral and ecological evidence for host associated differentiation in *Dasineuriola* sp. (Diptera: Cecidomyiidae).
- 2012- Ehud Gilad (Benayahu, Y. and Y. Edelman-Furstenberg).
Bivalve assemblages as environmental indicator.

- 2012- Idan Hayon (Dorchin, N.).
Taxonomy and biology of predatory gall midges (Diptera: Cecidomyiidae) on citrus mealybugs (Hemiptera: Pseudococcidae) in Israel.
- 2012- Idan, T. (M. Ilan)
Sponges and corals of the Mediterranean mesophotic reefs
- 2012- Ohad Mass (S. Meiri).
Latitudinal diversity of Israeli Mediterranean biome mammals.
- 2012- Noga Perry (Benayahu, Y. and U. Gofna).
Bacteria induce metamorphosis of coral planulae.
- 2012- Jonatan Reberger (F. Ben-Ami)
Parasite-Mediated Determinants of Coexistence between Sexual and Asexual Host Snails.
- 2012- Erez Shoham (Benayahu, Y.).
Soft corals of the mesophotic zone at Eilat (northern Red Sea).
- 2012- Ximena Velasquez Pedrosa (Benayahu, Y.).
Flat worms (Platyhelminthes) of the Israeli Mediterranean and Eilat shallow habitats.
- 2013 Davud Cumings (M. Goren)
The impact of water level and habitat composition and structure on reproduction of cichlids in Lake Kinneret.
- 2013- Camelia Gochev (Benayahu, Y. and G. Zilman).
Settlement of coral planulae in response to hydrodynamic conditions
- 2012- Itai Granot (Belmaker J.)
Processes structuring the assembly of fouling communities.
- 2012- Renanel Pickholtz (Belmaker J.)
Landscape ecology of invasive herbivorous fishes.
- 2013- Itai Granot (Shenkar, N. and Y. Belmaker)
Processes structuring the assembly of fouling communities.
- 2013- David Halfon (Shenkar, N. and G. Yahel)
Filter feeding in ascidians.

- 2013- Lilach Raichman (Shenkar, N.)
Ecological aspects of the invasive ascidian *Microcosmus exasperatus* .
- 2013- Hanna Rapuano (Loya, Y.)
Reproductive effort in fungiid corals.
- 2013- Nadav Reich (Shenkar, N.)
Biomechanics of invasive ascidians.
- 2013- Yaniv Shmuel (Shenkar, N.)
Reproduction of coral-reef ascidians
- 2013- Tom Schlesinger (Loya, Y.)
Recruitment of stony corals at the coral reefs of Eilat..
- 2013- Shelley Zalmanoviz (F. Ben-Ami and O. Rechavi)
Epigenetic effects of helmet formation in *Daphnia*.

Post-doctoral fellows

- 2010-2013 Annat Haber
- 2011- Razi Hofman
- 2011- Efrat Gavish Regev
- 2011-2013 Roi Dor
- 2012- Achik Dorchin
- 2012- Gil Koplovitz
- 2012- Rachel Sarig
- 2012 - Jarkko Routtu
- 2013 Hila May
- 2013- Meirav Meiri

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.

- 2009-2012 EU project (Technology Enhanced 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€
- 2010-2012 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).
- 2010-2012 Minerva fellowship (of the Max Planck society) for a post-doc researcher (Scharf, I.).
- 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- Israel Taxonomic Initiative grant for a taxonomic survey of the Tephritoidea (Diptera) of Israel (A. Freidberg with E. Morgulis)
- 2011-2012 Israel Nature and Parks Authority, Survey of freshwater molluscs in the Ein Afek nature reserve, NIS 28,980 (F. Ben-Ami).
- 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 Israel Taxonomic Initiative grant for taxonomy course with a foreign expert (S. Meiri with Lee Grismer)
- 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 Mekorot Israel National Water Co., Survey of invading freshwater snails and their parasites in the national water carrier of Israel, NIS 46,550 (F. Ben-Ami).
- 2012 The European Commission Marie Curie Career Integration Grants (CIG) €100,000 (Shenkar, N.).
- 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 Israel Taxonomy Initiative (ITI) grant - ITI Biodiversity Survey on the "Taxonomy of the Israeli Mediterranean demosponges" (Feldstein, T. and Shefer, S.).
- 2012 Israeli Taxonomy Initiative (ITI) grant for taxonomic surveys. \$8,000 (Dorchin, N.).
- 2012 National Geographic. The Northernmost Kites in the Southwest Asia: The Northwestern Fringes of the Ararat Depression (Armenia) Case Study (20,000\$) (D. Langgut, D. Nadel, G. Bar-Oz, B. Gasparyan, D. Malkinson and A. Khechoyan).
- 2012 SYNTHESYS fellowship: the European Union-funded Integrated Activities grant to study octocorals at Vienna useum of Natural History (Benayahu. Y.).
- 2012-2013 A survey of Benthic Macrobiota of the soft bottoms at Haifa Bay and Nitzanim. Israel Oceanographic and Limnological Research and Israel Ports Development and Assets Company Ltd.
- 2012-2013 Israel Science Foundation (Goren, M. and Ilan, M.).

- 2012-2013 Israel Taxonomy initiative (ITI): Biodiversity of Mesophotic Scleractinian corals in the Gulf of Eilat/Aqaba (Loya, Y.).
- 2012-2013 Israel Taxonomy initiative (ITI): Taxonomy & molecular systematics of the Ctenophore fauna along the coasts of Israel (PI in collaboration with Ada Alamaru, and Dorothee Huchon, TAU) (Loya, Y.).
- 2012-2013 ITI - Israel Taxonomy Initiative. Taxonomy and molecular systematics of the ctenophore fauna along the coasts of Israel. (\$ 18,000 D. Huchon, CI, 1/3 of the sum).
- 2012-2014 United States-Israel Binational Science Foundation (BSF), The maintenance of sex in a freshwater snail, USD 63,000 (F. Ben-Ami and C. Lively).
- 2012-2015 Israeli Ministry of Agriculture: Effects of sport fishing (NIS 150,000 per annum) (Benayahu. Y.).
- 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. 50,000 NIS/Year. Funding period: 36 months. (R. Holzman and M. Kiflawi).
- 2012-2015 The Israeli department of Agriculture. Seasonal growth and mortality in native and Lessepsian Mediterranean fish (Belmaker J, M. Kiflawi and D. Golani, 639,000 NIS).
- 2012-2016 Israel Science Foundation (ISF) Sex-allocation and sex change in mushroom scleractinian corals: a long term study (Loya, Y.).
- 2013 GIF – (German Israel Foundation). Interdisciplinary Research of Assyrian Siege Ramps - The Case of Tel Azekah (D. Langgut, O. Lipschits and M. Oming).
- 2013 ISF – (Israel Science Foundation). Royal Herodian Gardens Come Alive (50,000\$) (D. Langgut,)
- 2013 Mekorot Israel National Water Co., A study of invading freshwater snails and their parasites in Israel, NIS 97,900 (F. Ben-Ami).

- 2013 The German-Israeli Foundation for Scientific Research and Development Young Scientists' Program €40,000 (Shenkar, N.).
- 2013- Bination Science Foundation grant "Reptile diversity on tropical mountains: From the crucible of evolution to the furnace of extinction?" (S. Meiri and A. Allison, 200,000\$)
- 2013 ASSEMBLE grant (to offset costs of field research in Banyuls, France). Traits, Invasion and Mediterranean fish communities (Belmaker J, €10,000 (approximately)).
- 2013 Israel Science Foundation (ISF) New Faculty Equipment Grant. 308,000 ILS (Dorchin N.).
- 2013 Israeli Science Foundation (ISF) Individual Research Grant. 260,000 ILS (Dorchin N.).
- 2013 Israeli Taxonomy Initiative (ITI) grant for taxonomic surveys. \$8,500. (Dorchin N.).
- 2013 Keren Kayemet LeIsrael (KKL-JNF) Forestry Research grant. 110,000 ILS (Dorchin N.).
- 2013 Keren Kayemeth Le-Israel - Jewish National Fund. Re-cultivation of *Commiphora gileadensis* (the plant of Shemen Afarsimon). (250,000\$) (D. Langgut, A. Aharony, R. Berger, S. Zev, R. Ofir, N. Dudai, L. Hanuš and S. Ben-Yehoshua).
- 2013 SYNTHESYS fellowship: the European Union-funded Integrated Activities grant to study octocorals at British Museum of Natural History (Benayahu. Y.).
- 2013 Temminck Fellowship to study octocorals at National Center for Biodiversity, Naturalis, Leiden, Netherlands (Benayahu. Y.).
- 2013-2014 "Yad Hanadiv" Workshop Grant. Relative species abundance and rarity in coral reef fish (Belmaker J, 38,000\$).
- 2013-2015 The Rothschild Foundation (M. Ilan, R. Holzman, Y. Lota, N. Shenkar, A. Abelson and J. Belmekker)
- 2013-2016 Middle East Regional Cooperation (Program: U.S. Agency for International Development, Bureau for the Middle East (MERC-AID): Developing novel methodologies for preservation and maintenance of coral biodiversity (Loya, Y.).

2013-2017 Marie Curie Career Integration Grant. Causes and Consequences of Mediterranean Fish Invasions (Belmaker J, €100,000).

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
2012 Oct- 2013 Oct	D. Hulsey	University of Tennessee	USA	Fishes (Elat)
2012 Cct	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2012 Oct	Y. Tzuberi	Bar Ilan University	Israel	Molluscs
2012 Oct	R. Raven	Queensland Museum	Australia	Entomology
2012 Nov	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2012 Nov	A. Shcinin	Israel Academy of Sciences	Israel	Molluscs
2012 Nov	B. Singer	Israel Malacological Society	Israel	Molluscs
2012 Nov	A. Konstantinovsky	Israel Oceanographic and Limnological Research	Israel	Molluscs
2012 Nov	A. Evin	MNHN Pris	France	Mammals
2012 Nov	A. Skasberg	Bezalel	Israel	Mammals
2012 Nov	Hadar	Bezalel	Israel	Mammals
2012 Dec	D. Lavnent	University of Paris	France	Paleontology
2012 Dec	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2012 Dec	Y. Atzili	Bezalel	Israel	Mammals
2013 Jan	S. Vaisman	Ministry of Agriculture	Israel	Molluscs

Date	Name	Institute	Country	Taxonomic group
2013 Jan	O. Hazofe	Israel Nature and Parks Authority	Israel	Birds
2013 Feb	A. Ben David		Israel	Mammals and Birds
2013 Feb	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2013 Mar	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2013 Mar	L. Klein	Bar Ilan University	Israel	Molluscs
2013 Mar	O. Peleg	Israel Oceanographic and Limnological Research	Israel	Molluscs
2013 Mar	A. Konstantinovskiy	Israel Oceanographic and Limnological Research	Israel	Molluscs
2013 Mar	A. Dotan		Israel	Molluscs
2013 Mar	M. Penes	Tel Aviv University	Israel	Mammals
2013 Mar	N. David	Tel Aviv University	Israel	Mammals
2013 Mar	N. Sapir	Hebrew University	Israel	Birds
2013 Mar	E. Boutaud	Leuphana Universität	Germany	Entomology
2013 Mar	C. Drees	University of Hamburg	Germany	Entomology
2013 Mar	M. Staab	Leuphana Universität	Germany	Entomology
2013 Apr	B. Huber	Museum Koenig	Germany	Entomology
2013 Apr	O. Niehuis	Museum Koenig	Germany	Entomology
2013 Apr	M. Niehuis	University of Koblenz-Landay	Germany	Entomology
2013 Apr	R. Nawrot	University of Vienna	Austria	Molluscs
2013 Apr	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2013 Apr	A. Ben David		Israel	Mammals and Birds
2013 Apr	M. Blecher	Israel Nature and Parks Authority	Israel	Entomology
2013 Apr	I. Blecher	Israel Nature and Parks Authority	Israel	Entomology
2013 Apr	O. Biström	University of Helsinki	Israel	Entomology
2013 May	S. Vaisman	Ministry of Agriculture	Israel	Molluscs

Date	Name	Institute	Country	Taxonomic group
2013 April-May	L. Kim	UCL – University College London	UK	Anthropology
2013 May	O. Perry	Bar Ilan University	Israel	Molluscs
2013 May	A. Merom	Tel Aviv University	Israel	Mammals
2013 May	Y. Ciat		Israel	Birds
2013 Jun	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2013 July	I. Gurfinkel		Israel	Birds
2013 July	D. Sharon		Israel	Mammals and Birds
2013 July	A. Merom	Tel Aviv University	Israel	Mammals
2013 July	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2013 July	M. Mostovski	Natal Museum, UK	USA	Foraminifera
2013 July	Y. Hadas		Israel	Mammals
2013 July	H. Shirhi		Israel	Birds
2013 July	M. Mostovski	KwaZulu-Natal Museum	South Africa	Entomology
2013 Aug-Sep	A.M. Tillier	University of Pennsylvania	USA	Anthropology
2013 Aug	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2013 Aug	Z. Cohen-Sharon		Israel	Mammals and Birds
2013 Sep	S. Vaisman	Ministry of Agriculture	Israel	Molluscs
2013 Oct	Y. Ciat		Israel	Birds
2013 Oct	V. Meyer	University of Bordeaux	France	Anthropology

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 Mammals and Reptilia (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, Dorchin, 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
Introduction to Animal Kingdom: Invertebrates and Vertebrates (academic course)	A. Abelson and S. Meiri	Tel Aviv University	Mammals
Introduction to Archaeozoology	L. Sapir Chen	Tel Aviv University	Mammals
Archaeozoology workshop	L. Sapir Chen	Tel Aviv University	Mammals, Fish and Museum Class

Purpose	Name	Institute	Taxonomic group
Vertebrates Anatomy (academic course)	D. Eilam, M. Ovadia and U. Oron	Tel Aviv University	Reptilia, Mammals and Taxidermist
The Invertebrates: Comparative Functional Biology (academic course)	M. Ilan, Y. Benayahu and A. Abelson	Tel Aviv University	Invertebrates, Entomology and Histology
Ichthyology (academic course)	M. Goren	Tel Aviv University	Fishes and Museum Class
Trips in the experimental zoo and Natural History Museum (academic course)	T. Dayan	Tel Aviv University	Birds, Mammals and Reptilia
Biology and Systematic of Marine Invertebrates: (academic course)	Y. Benayahu	Interuniversity Institute for Marine Sciences	Invertebrates
Topics in Fish Biology (academic course)	R. Holzman and M. Kiflawi	Interuniversity Institute for Marine Sciences	Fishes
Osteology And Anthropology (academic course)	I. Hershkovitz	Tel Aviv University	Anthropology
From gatherers to eradicators? (academic course)	D. Langgut	Tel Aviv University	Palynology and Archaeobotany
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
Faunistics (academic course)	Z. Arad	Technion	Birds, Mammals and Museum Class
Faunistica (academic course)		Open University	Birds, Mammals and Museum Class

Purpose	Name	Institute	Taxonomic group
Paleoenvironmental conditions and past climate changes and their connection to human activities (academic course)	D. Langgut	Tel Aviv University	Palynology and Archaeobotany
Bird-Watching		Israeli Air Force	Birds and Museum Class
Bird-Watching		The Society for the Protection of Nature in Israel	Mammals, Birds and Museum Class
Various seminars	Nature Campus	Tel Aviv University	Mammals, Birds, Entomology and Museum Class
Guided tours to schoolchildren	Nature Campus	Tel Aviv University	Mammals, Birds, Entomology and Museum Class

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		Ben Gurion University	Entomology
Taxonomy Identification		Faculty of Agriculture at the Hebrew University	Entomology
Taxonomy Identification	J.J.I. Martinez	Tel Hai College	Entomology
Taxonomy Identification	I. Renan	Israel Nature and Parks Authority	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	U. Shalom, A. Sirati, D. Ish Shalom, T. Yeger	Ministry of Environmental protection	Arachnidae

Purpose	Name	Institute	Taxonomic group
Taxonomy Identification		Entomological Laboratory	Arachnidae
Taxonomy Identification		Plant Protection and Inspection Services	Arachnidae
Taxonomy Identification	S. Vaisman	Plant Protection and Inspection Services	Molluscs
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	M. Fisher	TAU	Molluscs
Taxonomy Identification	E. Sheffer	IOLR - Haifa	Molluscs
Taxonomy Identification	G. Rilov	IOLR - Haifa	Molluscs
Taxonomy Identification	B. Rinkevitch	IOLR - Haifa	Molluscs
Taxonomy Identification	D. Milstein	Israel Nature and Parks Authority	Molluscs
Taxonomy Identification	Y. Artzi	Israel Nature and Parks Authority	Molluscs
Taxonomy Identification	North Distric	Israel Nature and Parks Authority	Molluscs
Taxonomy Identification	A. Dotan	Israel Nature and Parks Authority	Molluscs
Taxonomy Identification	Y. Artzi	Israel Nature and Parks Authority	Nematoda
Taxonomy Identification	Y. Achitov	Bar Ilan University	Invertebrates: Stony Corals
Taxonomy Identification	Y. Artzi	Israel Nature and Parks Authority	Fishes
Taxonomy Identification		IOLR - Haifa	Fishes
Taxonomy Identification	B. Rinkevitch	IOLR - Haifa	Spong
Taxonomy Identification	R. Yahel	Israel Nature and Parks Authority	Spong

Purpose	Name	Institute	Taxonomic group
Taxonomy Identification		Israeli Air Force	Mammals
Taxonomy Identification		Israel Nature and Parks Authority	Mammals
Taxonomy Identification		Israeli Air Force	Birds
Taxonomy Identification		Israel Airport Authority	Birds
Taxonomy Identification		Israel Nature and Parks Authority	Birds
Molecular identification	D. Milstein	Israel Nature and Parks Authority	Crustacean
Molecular identification		Israel Airport Authority	Birds
DNA Shipment	S. Goldberg	Whittier College, USA	Reptilia
DNA Shipment	N. Poulakakis	Natural History Museum of Crete, Greece	Reptilia
DNA Shipment	W. Böhme	Alexander Koenig (ZFM), Germany	Reptilia
DNA Shipment	S. Carranza	Institute of Evolutionary Biology, Spain	Reptilia
DNA Shipment	S. Sfenthourakis	University of Cyprus, Cyprus	Reptilia
DNA Shipment	P. Pafilis	National and Kapodistrian University of Athens, Greece	Reptilia
DNA Shipment	K. Kavanagh	UMassAmherst, USA	Fishes
DNA Shipment	M. Alfaro	UCLA, USA	Fishes
DNA Shipment	M. Wainwright	UC Davis, USA	Fishes
DNA Shipment	D. Hulsey	U Tennessee Knoxville, USA	Fishes
DNA Shipment	R. Shachak	Weizmann <i>Institute</i> of Science	Fishes
Electronic Data	A. Evin	University of Aberdeen, UK	Mammalia

Purpose	Name	Institute	Taxonomic group
Electronic Data	Lior Weissbrod	University of Haifa	Mammalia
Electronic Data	M. T. Clementz	University of Wyoming, USA	Mammalia
Electronic Data	A. Boldo	Israel Nature and Parks Authority	Mammalia
Electronic Data	R. Talbi	Israel Nature and Parks Authority	Mammalia
Electronic Data	N. Ranc	University of Stockholm, Sweden	Mammalia
Electronic Data	R. Sindaco	ITALY	Reptilia
Electronic Data	A. Bashyal	Texas Tech University, USA	Reptilia
Electronic Data	E. Karameta	University of Athens, Greece	Reptilia
Electronic Data	P. Pafilis	University of Athens, Greece	Reptilia
Electronic Data	B. Shacham	Hebrew University	Reptilia
Electronic Data	S. Scholz	Goethe Universität Frankfurt, Germany	Reptilia
Electronic Data	A. Bouskila	Ben Gurion University	Reptilia
Electronic Data	P. Wagner	Zoologisches Forschungsmuseum Alexander Koenig, Germany	Reptilia
Electronic Data	E. Skourtanioti	University of Crete, Greece	Reptilia
Electronic Data	N. Poulakakis	University of Crete, Greece	Reptilia
Electronic Data	F. Ahmadzadeh	Zoologisches Forschungsmuseum Alexander Koenig, Germany	Reptilia
Electronic Data	J. Mendes	CIBIO, University of Porto, Portugal	Reptilia
Electronic Data	S. Goldberg	Whittier College, USA	Reptilia

Purpose	Name	Institute	Taxonomic group
Electronic Data	S. Roussos	Texas Tech University, USA	Reptilia
Electronic Data	A. Rinot	the Jerusalem Bird Observatory	Aves
Electronic Data	Y. Chiat	the Jerusalem Bird Observatory	Aves
Electronic Data	V. Nagarjun	Uppsala University, Sweden	Aves
Electronic Data	M. Laguerre	Institut européen de chimie et biologie, France	Entomology
Electronic Data	J. Zwier	Zoological Museum, Amsterdam, The Netherlands	Entomology
Shipment of Specimens	O.P. Melnyk	National University of Life and Environmental, Ukraine	Aves
Shipment of Specimens	R. Sindaco	Museo Civico di Storia Naturale, Italy	Reptilia
Shipment of Specimens	N. Poulakakis	Natural History Museum of Crete, Greece	Reptilia
Shipment of Specimens	S. Roussos	Texas Tech University, USA	Reptilia
Shipment of Specimens	P. Wagner	Zoologisches Forschungsmuseum Alexander Koenig, Germany	Reptilia
Shipment of Specimens	S. Goldberg	Whittier College, USA	Reptilia
Shipment of Specimens	T. Barros	Universidade de Aveiro, Portugal	Mammalia
Shipment of Specimens	O.P. Melnyk	National University of Life and Environmental, Ukraine	Mammalia
Shipment of Specimens	M. McGrouther	Australian Museum, Australia	Fishes

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	K. Bafo	The South African Institute for Aquatic Biodiversity, South Africa	Fishes
Shipment of Specimens	R. Bank	University of Groningen, the Netherlands	Molluscs
Shipment of Specimens	J.-J. van Poorten	the Netherlands	Molluscs
Shipment of Specimens	L.J. van Gemert	the Netherlands	Molluscs
Shipment of Specimens	Y. Imahara	Biological Institute on Kuroshio, Japan	Invertebrates: Soft Corals
Shipment of Specimens	J. Jurkowska	Wrocław University, Poland	Invertebrates: Soft Corals
Shipment of Specimens	R. Harerkort	Hawaini Institute of Marine Biology, USA	Invertebrates: Soft Corals
Shipment of Specimens	A. Cabrinovic	Natural History Museum, United Kingdom	Invertebrates: Soft Corals
Shipment of Specimens	B. Reijnen	National Museum of Natural History , Leiden The Netherlands	Invertebrates: Soft Corals
Shipment of Specimens	C.S. McFadden	Harvey Mudd College, USA	Invertebrates: Soft Corals
Shipment of Specimens	L. van Ofwegen	National Museum of Natural History , Leiden The Netherlands	Invertebrates: Soft Corals
Shipment of Specimens	E.L. Hirose	Fac. Sci., Univ. Ryukyus, Japan	Invertebrates: Ascidians
Shipment of Specimens	R. Pérez-Portela	Center for Advanced Studies of Blanes, Spain	Invertebrates: Ascidians
Shipment of Specimens	R. Jocqué	Royal Museum for Central Africa Leuvense Belgium	Arachnida
Shipment of Specimens	J. Hunchak	Arachnophiliacs Society Canada	Arachnida

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	I. Sääksjärvi	University of Turku Finland	Arachnida
Shipment of Specimens	C. Ribera	Universitat de Barcelona Spain	Arachnida
Shipment of Specimens	J. Malumbres-Olarte	Museum Botanisk Have, Denmark	Arachnida
Shipment of Specimens	L. Tu	College of life sciences, China	Arachnida
Shipment of Specimens	P. Lehtinen	University of Turku Finland	Arachnida
Shipment of Specimens	Y.M. Marusik	University of Turku Finland	Arachnida
Shipment of Specimens	S. Aharon	Ben Gurion University	Arachnida
Shipment of Specimens	D.V. Logunov	The University of Manchester, UK	Arachnida
Shipment of Specimens	S. Koponen	University of Turku Finland	Arachnida
Shipment of specimens	M. Uliana	Museo di Storia Naturale di Venezia, Italy	Entomology
Shipment of Specimens	M. Kuhlmann	The Natural History Museum, London UK	Entomology
Shipment of Specimens	M. Niehuis	Zoological Research Museum Alexander Koenig, Bonn, Germany	Entomology
Shipment of Specimens	K.M. Harris	Ripley, Woking, Surrey, UK	Entomology
Shipment of Specimens	B. Pauly	Zoological Institute RAS, St. Petersburg, Russia	Entomology
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	G.A. Evans	USDA, Beltsville, MD, USA	Entomology

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	S. Patiny	Gembloux Belgique	Entomology
Shipment of Specimens	E. Scheuchl	Vlden, Germany	Entomology
Shipment of Specimens	S. Risch	Leverkusen, Germany	Entomology
Shipment of Specimens	H. Dathe	Deutsches Entomologisches Institut, Germany	Entomology
Shipment of Specimens	A. Müller	Entomological Collection, Switzerland	Entomology
Shipment of Specimens	K. Rognes	University of Stavanger Norway	Entomology
Shipment of Specimens	A.P. Gary	Canadian National Collection of Insects, Canada	Entomology
Shipment of Specimens	X. Espadaler	Universitat Autònoma de Barcelona, Spain	Entomology
Shipment of Specimens	M. Nabozhenko	Southern Scientific Centre, Russia	Entomology
Shipment of Specimens	K. Schön	Czech Republic	Entomology
Shipment of Specimens	P. Weill	Pau France	Entomology
Shipment of Specimens	P. Bulirsch	Czech Republic	Entomology
Shipment of Specimens	M. Daccordi	Museo Civico Storia, Italy	Entomology
Shipment of Specimens	A. Riedel	Staatliches Museum Für Naturkunde, Germany	Entomology
Shipment of Specimens	A. Velázquez	De Castro Calle Denia, Spain	Entomology
Shipment of Specimens	O. Bistrom	University Of Helsinki, Finland	Entomology
Shipment of Specimens	M. Cerny	Czech Republic	Entomology
Shipment of Specimens	J. Yukawa	University Matsuzaki, Japan	Entomology
Shipment of Specimens	R. J. Gagné	Usa	Entomology
Shipment of Specimens	R.B. Angus	The Natural History Museum Cromwell, U.K.	Entomology

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	M. Von Tschirnhaus	Universitaet Bielefeld, Germany	Entomology
Shipment of Specimens	J. Astrin	Museum Koenig, Germany	Entomology
Shipment of Specimens	Y. Gotlieb Koret	Hebrew University	Entomology
Shipment of Specimens	H.R. Feijen	Naturalis Biodiversity Centre, The Netherlands	Entomology
Shipment of Specimens	S. D. Gaimari	California Department Of Food And Agriculture, U.S.A	Entomology
Shipment of Specimens	T. Zeegers	The Netherlands	Entomology
Shipment of Specimens	N.L. Evenhuis	Bishop Museum, U.S.A	Entomology
Shipment of Specimens	K. Reinhardt	University Of Sheffield, Uk	Entomology
Shipment of Specimens	V. Neimorovets	Institute Of Plant, Russia	Entomology
Shipment of Specimens	P.V. Putshkov	Schmalhausen Institute Of Zoology, Ukraine	Entomology
Shipment of Specimens	N. Emery	Trent University, Canada	Entomology
Shipment of Specimens	J. Heraty	University Of California, Usa	Entomology
Shipment of Specimens	P. Williams	Natural History Museum, Uk	Entomology
Shipment of Specimens	M. Terzo	Université De Mons, Belgique	Entomology
Shipment of Specimens	J. Noyes	Natural History Museum, Uk	Entomology
Shipment of Specimens	C. Hansson	Zoological Museum, Sweden	Entomology
Shipment of Specimens	A. Liston	Entomologisches Institut, Germany	Entomology
Shipment of Specimens	C. Praz	Eth Zurich, Switzerland	Entomology
Shipment of Specimens	M. Buffington	Smithsonian National Museum Of Natural History, U.S.A	Entomology

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	D. Smith	Smithsonian Institution, U.S.A	Entomology
Shipment of Specimens	R. Peters	Zoologisches Forschungsmuseum, Germany	Entomology

Collections budget

הוצאות שכר

סך העלות	מספר משרות	
5,448,435	18.50	סה"כ אוצרים
2,911,838	6.00	אוצרים (1)
1,031,476	2	אוצרים - עמיתי מחקר
0	6	אוצרים בגמלאות
879,666	3.5	מדענים עולים
625,455	1.0	אוצרים נלווים (2)
4,966,732	18.23	סגל טכני (4)
10,415,167	36.73	סה"כ הוצאות שכר

מלגות

800,381	מלגות פוסט דוק
800,381	סה"כ מלגות

הוצאות שאינן שכר

180,000	הוצאות אחסון
220,000	הוצאות שימור
194,000	הוצאות תיעוד וקטלוג
110,000	הוצאות לשיפור מצב האוספים (3)
704,000	סה"כ הוצאות שאינן שכר

11,919,548	סה"כ הוצאות לפני הוצאות מנהל ומשק
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2,383,910	הוצאות מנהל ומשק (20%)
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14,303,458	סה"כ הוצאות
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מקורות מימון

3,391,000	השתתפות ות"ת:
177,000	השתתפות ות"ת - קמ"ע
3,214,000	השתתפות ות"ת
9,610,793	השתתפות מוסד:
2,040,770	השתתפות המוסד בהוצאות שכר האוצרים
3,681,732	השתתפות המוסד בהוצאות שכר הסגל הטכני
1,504,381	השתתפות המוסד בהוצאות שאינן שכר
2,383,910	השתתפות המוסד - הוצאות כלליות
1,301,665	הכנסות מגופים ציבוריים:
1,285,000	מענקי מחקר
16,665	משרד הקליטה
14,303,458	סה"כ הכנסות
0	עודף (גרעון)

- (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-M6\$ הנדרשת למחשוב אוסף אנטומולוגי והעלאת קואורדינטות על נתוני אוספים.

תקציב מתוכנן של מרכז הידע התשתיתי לתקופה 1.12.2011-
30.11.2012

דו"ח כספי מפורט ישלח על ידי האוניברסיטה אחרי ה 30.11.2013.

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

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 Robert 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

Dan David (Sadly passed away several weeks ago)

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, Reuven Merhav, 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.

Sponsors' Steering Committee: Yeshayahu Bar-Or (Chair), David Mingelgrin, Miriam Freund, Yael Siman-Tov, Ofer Lugassi , 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 Loya, 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

Prof. 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
Dr. Yossi Yovel – Associate Curator of Chiroptera
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
Noam Lichtentrit – Technical Support – Taxidermy
Ori Frid – Technical Support – Taxidermy

Division of Fishes

Dr. Jonathan Belmaker – Curator of Mediterranean Fishes
Dr. Roi Holzman – Curator of Red Sea Fishes
Dr. Menachem Goren – Curator of Fishes
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 Levitt – Technical Support – Crustacea

Division of Entomology

Dr. Netta Dorchin – Head Curator – Diptera
Dr. Amnon Freidberg – 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. Inon Scharf – Associate Curator of Neuroptera
Dr. Gal Ribak – Associate Curator of Coleoptera
Dr. Dany Simon – Collection Associate of Neuroptera
Dr. Moshe Guershon – Collection Manager – Hymenoptera and Collections
Staff Manager
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
Elisabeth Morgulis – Technical Support
Oz Rittner – Collection Manager – Coleoptera
Dr. Avi Keysary – Volunteer

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. Youri 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

Division of Fungi

Dr. Nissan Binyamini (ret.) – Curator emeritus

Biological Anthropology Museum

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

Julia Abramov – Collections Manager – Physical Anthropology

Yaser Salaymeh – Technical Support – Physical Anthropology

Barbara Astafurova-Poltoratsky – Technical Support – Physical Anthropology

Hadas Levin – Technical Support – Physical Anthropology

Adi Egozi – Technical Support – Physical Anthropology

Division of Biological Archeology

Sonia and Marco Nadler Institute of Archeology

Faculty of Humanities

Dr. Dafna Langgut – Curator of Palynology and Archeobotany

Dr. Lidar Sapir-Hen – Collections Manager – Archeozoology

Helena Rot – Technical Support – 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 – Office administration and public programs Coordinator

Ilil Pratt – Project Manager/Content Developer

Daphna Lev – Project Manager/Content Developer

Chen Biton - Administrative Assistant

Anat Feldman – Editor

Halina Hamou – Prinicpal 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 Steinberger, Bella Galil, Yael Lubin – Steering Committee

Dr. Daniella Bar-Yosef – Coordinator