

The national collections of natural history at Tel Aviv University: A biodiversity, environment, and agriculture research knowledge center

2007/2008 Scientific Report

Submitted to the Ministry of Science

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

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Introduction

This academic year the collections enjoyed the support of the Ministry of Science, Culture and Sports, having been declared a Knowledge Center by the ministry. So in terms of training, collections care and improvement, significant steps were made this year to promote the collections as a research infrastructure and as well as to promote collections-based research.

Our report focuses only on academic achievements made with the use of the natural history collections at TAU during the academic year 2007/2008. This use ranges from biogeographic collections-based research, to use as comparative materials in 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.

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 more scientific activity than can be discerned from the present report.

Progress at 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.

Collections News – A word from our collection managers

During the academic year 2007/2008 we continued our day-to-day activities at the Natural History Collections. As in previous years, we have invested much effort in 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 to those requesting them, and assist graduate students, academic courses, and “Nature Campus” activities.

Throughout the past year we have received and incorporated about 15,000 specimens from various taxonomic groups, collected worldwide by the collection curators and staff, students, rangers from the Israel Nature and Parks Authority, and others. As previously reported, the reptile collection is now active and more than 300 new records have been added this past year. Most of these were collected by graduate students during their field work.

We have continued to transfer the dry vertebrate collection to new specimen cabinets, purchased with the support of VATAT funds. About 380 new specimens have been preserved and added to the mammal collection and about 50 to the bird collection. These include specimens collected by rangers from the Israel Nature and Parks Authority and transferred to Tel Aviv University, where they are labeled and preserved by a professional taxidermist.

Our taxidermist, Igor Gavrilov, participated this year in "The World Taxidermy Championship" in Salzburg. His bird exhibit (starring *Ceryle rudis* and *Halcyon smyrnensis*) was entered into the competition and during his stay he attended many seminars and workshops, studying the latest taxidermy techniques.

The collections obtained from Prof. Bella Galil and Dr. Menachem Goren's research at various stations in the Mediterranean (see below: Collection trips) have been sorted, preserved, and digitized for future research and identification.

The material includes fishes, crustaceans, mollusks, and other invertebrates. Nearly all new data available on the macro-fauna of the Mediterranean can be attributed to these collection trips.

Almost 400 new specimens were added to the soft coral collection this year. Prof. Yehuda Benayahu began preparing a collection of slides from soft coral paratypes and types skeletons. To date, about 600 slides have been prepared. During October 2007 an international soft coral taxonomic workshop took place in Phuket Marine Biology Center (TPMBC, Thailand). Prof. Yehuda Benayahu was one of the resource persons of this activity in which 25 students from different countries participated. The students had the opportunity to get training in taxonomic practices of Octocorallia, their ecology and biology.

Routine work on the insect collection includes labeling and sorting of specimens from collecting trips and donated collections; identification of and research on select groups (including over 52 shipments of scientific specimens to specialists, mostly overseas, during 2007/2008). As in the past years, we have continued digitizing this collection. Newly-caught insects are immediately given a catalog number and digitized. During the current year approximately 1,000 new insects were added to the collection and more than 7,500 old specimens were digitized. Vladimir Chikatunov performed extensive identification work on a beetle collection caught in pitfall traps and malaise traps from various projects and areas (southern Arava and southern Jordan, Mt. Carmel, Nizzanim, Adullam, Avedat and Lehavim, the coastal plain, Nahal Shaharut, the Jordan Valley and others). There is a close working relationship between the "Plant Protection and Inspection Services" (PPIS, Ministry of Agriculture) and the insect and arthropod staff. As in previous years, the collection staff have provided identification services and guided the PPIS members.

After years of awaiting a "father", the Apoidea collection is now curated by Dr. Moshe Guershon. Following a preliminary inventory, we now know that this important collection contains about 30,000 specimens. Although not all of them have yet been classified, most are distributed among eight families, approximately 90 genera, and with more than 1,300 determined species. The majority of the species are exemplars from the Israeli fauna, but also feature a respectable number of representative specimens from all over the world. All of this information has been uploaded to a digitalized data base, which will allow easy access for scientific and technical investigations. Dr. Moshe Guershon is also working on determination of the unclassified material and preparing an interactive practical identification key for Israeli bees, based also on the collection and the data base.

We began curating the isopod and other terrestrial invertebrate collection donated by Prof. Michael R. Warburg. To date, more than 650 isopod specimens have been incorporated into the collection, which gives us an opportunity to study the unique fauna of the Isopods of Israel.

We continue our fruitful cooperation with students collecting samples in the field. These collections are immediately digitized in order to facilitate the easy transfer of specimens to the museum in the near future. Cooperation between students and the collections staff is excellent. We give the students support in all areas including preservation, identification, labeling and cataloguing. Tirza Stern has developed a unique data base for this purpose and continues to work with the students, adjusting it to their specific needs. Prof. Avital Gasith's students have already transferred to the National Collections more than 4,500 items (800 from this year alone), consisting of freshwater invertebrates caught in various rivers in Israel. Prof. Tamar Dayan's students have transferred to the museum a very large collection of mammals, amphibians, reptiles and arthropods caught in pitfall traps. The vertebrates among them have been preserved, identified, digitized and labeled and the invertebrates have been

preserved and sorted for future identification. An additional collaboration is being conducted with the laboratory of Dr. Yael Mandelik from the Faculty of Agricultural, Food and Environmental Quality Sciences, a collaborative project with Prof. Tamar Dayan and Prof. Abraham Hefetz. The research engages with biodiversity and ecosystem services in the arid agro-natural landscape of the Arava Rift Valley, across the Jordanian-Israeli border. It focuses on the pollinator guilds, specifically bees, and the pollination services they provide to crops and wild plants. Wild and managed bees (*Bombus* and honey bees) are collected, using netting and pan traps (plates filled with soapy water). The museum staff is directing this research, instructing on how to identify the insects and how to conduct a collection. All the Hymenoptera specimens in this research are properly labeled and have a museum catalog number. At the end of this study the items will be incorporated into our collections.

Progress Report for the Mollusc Collection 2007-2008

Henk K. Mienis and Revital Ben-David-Zaslow

The research project carried out by Dr. M. Goren in cooperation with Dr. B.S. Galil on "The impact of biological invasions and climatic change on the biodiversity of the Mediterranean Sea" has also influenced the mollusc collection. Especially noteworthy are the numerous cephalopod samples, preserved in ethanol, which were received for study and permanent housing in the collection.

This year we again identified a large number of littoral molluscs, which had been collected by Dr. E. Shefer (Israel Oceanographic & Limnological Research Institute, Haifa) at certain pre-determined stations along the Mediterranean coast for her research on the presence of heavy metals. Likewise, Dr. S. Moran sent us for identification some 20 samples of land snails intercepted by inspectors from the Plant Protection & Inspection Services of the Ministry of Agriculture & Rural Development and found on imported and

exported agricultural and horticultural merchandise. In addition, much new material was received from colleagues and friends in Israel and abroad (see new acquisitions). Between all these various activities we have continued the revision and incorporation of the collections of Derk A. Visker (received in the early 1970's) and Haim (Vittal) Treves (received in 1999) into the general Mollusc Collection.

The identifications were carried out by Henk Mienis, while Revital Ben-David Zaslow and Oz Ritner dealt with computerization of the material. At the moment 41,170 samples representing 5,485 taxa in the mollusc collection have been digitized.

New acquisitions

New material has continued to arrive at the collection. All the samples are immediately identified and prepared for permanent storage. Just before finishing this report we received the private shell collection of Mr Zvi Orlin (Qiryat Motzkin), consisting of over 8,000 samples, for permanent conservation in the National Mollusc Collection. A full report on this collection will be given in the Annual Report for the academic year 2008/2009. During the academic year 2007/2008 new material was received from the following persons:

Name	Brief description of the material
M. Agren	Terrestrial snails Western-Sahara
Y. Bar	Terrestrial snails from Israel
Z. Bar	Terrestrial snails from Israel and Cyprus
G. Bartman	Terrestrial snails from California, U.S.A.
K.H. Beckmann	Terrestrial and freshwater molluscs from Malta
R. Ben-David-Zaslow	Freshwater molluscs from Israel
B. Dharma	Neritidae from Indonesia
D. Fehse	Triviidae from the Indo-Pacific
B.S. Galil	Marine molluscs from the Mediterranean Sea off Israel
M. Goren	Marine molluscs from the Mediterranean off Ashdod and Turkey.
J. Grego	Terrestrial snails from Slovakia
E.L. Heiman	Marine molluscs from Philippines
A. Israeli	Freshwater molluscs from Israel

M. Keppens	Molluscs from Belgium, Italy, New Guinea and New Zealand
Y. Krotman	Terrestrial and freshwater snails from Israel
K. Lamprell	Marine bivalves from Australia
Z. Lewy	Freshwater molluscs from Israel
O. Ma'or	Freshwater molluscs from Israel
D. Mienis	Terrestrial and freshwater molluscs from Israel
H.K. Mienis	Molluscs from Netherlands, Israel, Turkey and world wide
C. Mifsud	Paratypes of a new marine mollusc from Malta
O. Mor	Freshwater molluscs from Israel
Z. Orlin	Marine, terrestrial and freshwater, world wide molluscs
O. Orlov	Terrestrial snails from Czechia
R. Ortal	Freshwater molluscs from Israel and terrestrial snails from Italy
J. Reichholf	Freshwater snails from Costa Rica
O. Ritner	Terrestrial snails from Brazil and Israel
P.M. Sammut	Terrestrial snails from Malta
O. Santos	Terrestrial and marine snails from South America
G. Scheller	Marine molluscs from the Indo-Pacific
H. Schütt	Terrestrial and freshwater molluscs from Syria
E. Schwabe	Neritidae from Western Samoa
E. Shefer	Marine molluscs from the Mediterranean coast of Israel
A. Shmida	Terrestrial and freshwater snails from Morocco, Jordan and Israel
B.S. Singer	Marine molluscs from the Gulf of Aqaba
Y. Taslitsky	Marine molluscs from the Mediterranean coast of Israel
J.S. Torres Alba	Terrestrial snails from Spain and Morocco
B. Verdcourt	Land- and freshwater molluscs from Israel
U. Werner-Reiss	Freshwater molluscs from the Sea of Galilee

Type Material

Shortly before his death, Karl-Heinz Beckmann (1948-2008) donated two paratypes of *Trochoidea (Xeroclausia) gharlapsi* Beckmann, 1987, an endemic Maltese land snail, to the mollusc collection (TAU MO 59289). From our colleague Bella Galil we received a paratype of a new Rissoid species: *Setia levantina* Bogi & Galil, 2007 (TAU MO 52282), which had been discovered along the Tel Aviv shore of the Mediterranean Sea at a depth of 20-25m. Charles Mifsud sent us three paratypes of a new Turrid species from the Mediterranean waters near Malta: *Mangelia melitensis* Cachia & Mifsud, 2008 (TAU MO 57001).

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Mollusc conservation

A tropical freshwater snail *Thiara scabra* (Müller, 1774) was recently found for the first time in two areas in Israel: Nahal Qibbuzim in Emeq Bet She'an and the Sea of Galilee (Yam Kinneret) (Mienis, 2008; Mienis, H.K. & Mienis, D., 2008a-b). Its presence in the Sea of Galilee, the major source of drinking water in Israel, is especially alarming. Near Kibbutz Ma'agan over 6000 specimens per square meter were counted in April 2008! In that corner of the lake it is already by far the most numerous gastropod species and in a relatively short time it seems to have replaced its local relative *Melanoides tuberculata* (Müller, 1774). Even more alarming is the fact that it may also endanger the endemic *Falsipyrgula barroisi* (Dautzenberg, 1894).

This Thiariid species most probably arrived in Israel as a hitchhiker on aquarium plants and, after becoming too prolific in local aquaria, excess snails were then released into natural aquatic habitats, as has been done with other aquarium plants and animals in the past. It is now already too late to remedy the current situation. However, more stringent laws should be introduced to regulate the aquarium trade.

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Progress Report for the Paleontological Collection 2007-2008

Yuri Katz, Olga Orlov-Labkovsky and Henk K. Mienis

During the past academic year Yuri Katz has studied the microfossils (Foraminifera, Porifera, Bryozoa, Brachiopoda and several representatives of other phyla) present in Quaternary bottom samples from the Gulf of Aqaba. In addition, he is working on the general taxonomy of the Protozoa.

Olga Orlov-Labkovski is working on foraminiferal assemblages of the Visean and Serpukhovian deposits representing the Carboniferous period (Upper Paleozoic) in the Middle Tien-Shan (Central Asia, Uzbekistan and Kazakhstan).

Thin-sections with foraminiferal assemblages were cut from samples collected from the continuous marine Carboniferous sequences of two sections of the Visean-Serpukhovian transition: Mashat section (river Mashat, Tallas Alatau Range, Kazakhstan), which was deposited on the inner platform of a shallow sea and is rich in fossils; and Paltau section (river Paltau, on the right-bank, Chatkal Range, Uzbekistan), which was deposited in a basinal setting.

The thin-sections represented assemblages of the following foraminiferal zones, which are arranged stratigraphically bottom-up:

- the Visean Stage – the *Nodosarchaediscus saleei* – *Archaediscus gigas* and the *Endothyranopsis crassa* zones;
- the Serpukhovian Stage – the *Neoarchaediscus regularis* – *Biseriella parva* zone, the *Eosigmoilina explicata* – *Loeblichia minima* – *Plectostaffella primitiva* zone and the *Plectostaffella miri obtusa* zone.

This material has been revised and photographed (about 500 pictures), and will be transferred to the Palaeontological Collection when it will be digitized.

The material is of fundamental importance for understanding the biostratigraphical position of the Visean-Serpukhovian boundary, which is at the moment a topic of discussion by the Sub-committee on Carboniferous

Stratigraphy of the International Commission on Stratigraphy of the Union of Geological Sciences (IUGS).

Samples of fossil representatives of certain families among the Gastropoda-Mollusca have been revised. Henk Mienis carried out a revision of the Neritidae and Viviparidae, André Burger (the Netherlands) dealt with the Strombidae and the Rostellariidae, and Dirk Fehse (Germany) studied the Cypraeidae, Triviidae, Ovulidae and Eratoidae.

The mollusc collection of Derk A. Visker (received in the early 1970's) contains numerous fossil molluscs from the Eocene of France, Pliocene of Belgium and Pleistocene of the Netherlands. The collection of A. Hadar contains some fossil material from the Pliocene and Pleistocene of North America. Henk Mienis is currently updating the identifications of these samples, and after computerization they will be transferred permanently to the general Paleontology Collection.

New acquisitions

Some new material has been received for the collection. Most of the material consists of molluscs and ranges from a few items (O. Kerman and D. Mienis) to several large soil samples of quaternary age taken from the Hula Valley near Gesher HaPekak (N. Bergman). This material, over 100 kg in weight, is extremely rich in freshwater molluscs.

Name	Brief description of the material
N. Bergman	Quaternary material (mainly molluscs) from two trenches in the former Hula swamps in the vicinity of Gesher HaPekak
O. Kerman	Fossil molluscs Campanian, Israel
D. Mienis	Various fossil molluscs from Israel
R. Ortal	Two fossil fishes from the Upper Jurassic, Lower Tithonian, from Eichstätt, Germany

Research activities 2007-2008: Report for the Israel Academy of Sciences

Daniella E. Bar-Yosef Mayer

Over the past year most of the research has been devoted to two main fields: study of mollusc shell assemblages and the study of the earliest stone bead assemblages discovered in archaeological sites in Israel. The research of both topics is based on comparison of the archaeological finds to comparative collections of shells and minerals.

One of the shell assemblages studied is that of the Qafzeh Cave in the Lower Galilee. This assemblage comprises only 10 shells; however, being one of the earliest such assemblages in the world, it represents the activities of archaic *Homo sapiens* from about 92,000 years ago. Because of its significance to going on debate in the archaeological literature concerning evidence for the behavior of modern humans, each of these shells has been described in detail. Furthermore, the species represented, *Glycymeris insubrica*, is a bivalve species on the verge of extinction in the eastern Mediterranean; hence, gathering information on its history is also of interest. A paper on this topic has been submitted to the Journal of Human Evolution and is currently under review.

This past year was also dedicated to the final analysis and publication of shell middens the Late Stone Age (eighth millennium BP) from the Red Sea coast of Eritrea. The research revealed that following climate changes around 7,300 years ago, and in particular a change in the regime of monsoon rains in north east Africa, as human populations settled along the coast. They profited from the proximity to fresh water, as well as food from the particular shells that were available in that area despite the harsh climate conditions. A paper on this study is in now press in the Journal of Island and Coastal Archaeology.

Scaphopods are molluscs known by their popular name, tusk shells, or by the common genus, *Dentalium*, and were used by prehistoric humans of the Natufian culture (ca. 14,500-11,500 years ago) as personal ornaments. Such

shells are common in graves and domestic areas, and decorated the skulls and skeletons of these people. The origin of these shells is now known to be in the Mediterranean, the Red Sea and also from fossil exposures. To ascertain the origins we engaged in a detailed taxonomic study with a graduate student from the Polish Academy of Science, Ms. Aldona Kurzawska, and with the collections manager of Israel's mollusc collections, Mr. Henk K. Mienis. Initial results are being prepared for publication.

In July 2008 I joined an international excavations expedition at the Neolithic site of Çatalhöyük, Turkey. The study of mollusc shells from this site will benefit both cultural and environmental aspects of the research. The identification of the shell species, and especially their origins, will disclose the areas of south-west Asia with which the human population exchanged trade and relations. Dozens of shells were brought to the site from the Mediterranean, Red Sea and other locales. Thousands of shells from nearby freshwater sources produced food, served as raw material for decorations, and as raw material for the construction of mud bricks, from which most houses at the site were built. Researchers at the site disagree on the environmental reconstruction of the site at 7400–6000 cal bc, based on geological and botanical reconstructions. Along with a Turkish malacologist, Dr. Burçin Gümüş, and in consultation with Mr. Henk K. Mienis, we will attempt to add our own insight to the environmental reconstruction of the site, based on the molluscan fauna.

Research of the earliest stone beads produced by humans in the Levant was carried out in collaboration with Dr. Naomi Porat of the Geological Survey of Israel. In a recently published paper we demonstrated that there is a connection between the appearance of green stone beads and the onset of agriculture about 11,000 years ago. Our suggestion that green stone beads had a symbolic value connected to fertility was published in the Proceedings of the National Academy of Sciences.

Some of the projects mentioned above have been completed (Qafzeh, Erithrea), while others are still ongoing (Natufian Dentalium, stone beads, Çatalhöyük shells). Additional studies are planned, including a study of the aquatic resources of the Natufian culture.

Progress Report for the Fungi Collection 2007/2008

Project: Biodiversity and conservation of higher Basidiomycetes in Israel

Silvia Blumenfeld

During this year we have worked on the following items:

Taxonomy and ecological diversity of fungi in Israel

Order Agaricales. Following the revision of the two main Orders of higher fungi, Agaricales and Aphyllophorales, we continued working on the data base of toxic Agaricales, classifying them into groups according to the mycotoxin content and certain ecological features. During this time we have established five species that had not been previously recorded from Israel.

Order Aphyllophorales. We have found 18 new records for Israel of wood-rotting fungi (Aphyllophorales). All the species were located in Tel Aviv, in the Botanical Gardens of Tel Aviv University and in northern area, in the Beit Oren forest.

Fungal culture collection

We have continued to add new strains to the filamentous fungi collection from Israel and other countries. We started working on this collection in Israel in 2003, continuing the LIHLCOM collection that I began to curate in 1992 in Argentina. Two years ago we affiliated the collection with the World Federation of Culture Collections (WFCC), and to the World Directory of Collections of Culture of Microorganisms (WDCM), which holds the world data base of microorganisms. At present we have records of 225 species and 52 genera.

New biotechnologies applied to wood-rotting fungi

As we reported last year, our work with wood-rotting fungi led us to the possibility of presenting a patent on medicinal mushrooms. During this period we have worked on new extraction methods (with better yields) of betaglucans and antiviral fractions of two strains of the TAUFCC fungal culture collection. We are now seeking financial support for such a patent.

Interim report on the partial revision of the genus *Camponotus* and the associated curating activity

Armin Ionescu

During the past year we have prepared a provisional annotated list of the *Camponotus* species from Israel (with synonyms, previous records, notes and material examined) and the associated identification key. The annotated list was compiled following examination of all specimens from the TAUI and PPIS collections, plus type material received on loan. It contains 18 Israeli species and eight imported species. Prior to examination of the original material deposited at MCZ Harvard, three species previously reported in the literature were considered of uncertain taxonomic status. Following the revision of previous work and examination of available material, the number of *Camponotus* species reported to belong to the Israeli fauna has now increased from the 11 published to 18.

Over the years, the TAUI collection has incorporated identified and unidentified material from several private collections, e.g. the E. Schmitz, J. Palmoni and H. Bytinski-Salz collections. In these collections especially, the identification of many specimens has changed as a result of the current revision. Consequently, as part of the curating activity of the ant collection, the placement of many specimens has also changed.

The revision included a reexamination of the identification of each specimen in the collections. About 900 ant specimens that were previously considered representatives of intra-specific variability are now candidates for remeasurements and photography. These specimens will form the basis of the new arrangement of the *Camponotus* species in TAUI.

Progress Report: Ascidian Collection 2008

Project: Taxonomic study of the ascidian fauna along the Israeli coasts

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 3,000 species found in all marine habitats from shallow water to the deep sea. Despite the enormous progress that has been achieved in the field of ascidian research worldwide, only a few studies have focused on the ascidians of the Red Sea and the Eastern Mediterranean. The current study's main goal is to establish an up-to-date museum collection of ascidians of these regions, with a focus on documenting the arrival and spread of non-indigenous species along the Mediterranean coast. In order to allow identification of ascidians to species level, the live material must be fixed in formaldehyde, preventing in many cases DNA-based research for most of the ascidian collections worldwide. The uniqueness of the current collection is that it will enable future molecular based studies on material preserved in ethanol together with classic taxonomic studies on the matching species. The collection currently includes more than 500 items and is expanding. To date, 60 specimens have been identified from the Mediterranean coast of Israel, including seven non-indigenous species. In addition, a new species to science belonging to the genus *Rhopalaea* is now being described. Several day-trips have been conducted to the Hadera Electric Company pier, the Dor-Habonim nature reserve, Atlit, Nahariya and Achziv, together with extensive sampling in Eilat, Gulf of Aqaba.

Progress Report: Spider Collection 2008

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

Efrat Gavish-Regev

Although at least 50 spider families are known from Israel and some of them have been extensively studied, there is still a scarcity of knowledge on the taxonomy, biology, and ecology of many of these spider families. Sheet-web spiders (Linyphiidae) are the second largest family of spiders, with approximately 4,345 species (>10% of all known spider species) in 576 genera. Linyphiids have a worldwide distribution, and are most diverse in the northern temperate regions where they account for a large fraction of spider species richness. Despite their prominence in most terrestrial ecosystems, much of spider diversity, and particularly of linyphiids, remains poorly documented. Currently only six linyphiid species are reported from Israel. The knowledge on linyphiids in semi-arid and arid habitats is limited, making linyphiid species richness in these areas is largely unknown. In our research, we describe and document the linyphiid fauna of Israel, and the geographic distribution ranges and habitat preferences of the linyphiid species. In order to do so, we are currently sorting material from the Arachnid Collection of the Zoology Department, Tel-Aviv University, the Arachnid Collection of The Hebrew University of Jerusalem, and the research collections of the Ecology Department at Ben-Gurion University of the Negev. The specimens have been identified to species level, and new species have been described/ re-described. To date we have found 24 linyphiid species, only one was previously reported from Israel. Out of the 24 species, seven are presumably new to science and are now being described. The spider collection at Tel-Aviv University contains material collected during ecological studies from various regions of Israel by Dr. Yael Mandelik and Arie Landsman, Udi Columbus and Tal Levanony, Ina Steinberg, Merav Vonshak, and Orit Skutelsky.

Ant surveys: The little fire ant (*Wasmannia auropunctata*)

Merav Vonshak

Following the discovery of the little fire ant (*Wasmannia auropunctata*) in Israel at the end of 2005, we conducted a survey, from January 22nd to March 7th 2006, in order to evaluate the extent of the infestation. The ants were found in four out of five of the villages that were examined, in agricultural fields and a nature reserve, implying a much larger infestation. The results were set on GIS maps and transferred to the Ministry of Environmental Protection to aid eradication. We later conducted one-day surveys of newly-discovered infestations in Dafna, Ma'abarot, Tel Aviv, Newe Yaraq, Hod Hasharon, Ramot Hashavim and Savion, between October 2006 and September 2008, in some of which individuals from the Ministry of Environmental Protection or the Israel Nature and National Parks Protection Authority participated. All data regarding the ants' distribution was shared with the Ministry of Environmental Protection. All data regarding the ants' distribution was shared with the Ministry of Environmental Protection. Additionally, for the past 18 months we received 180 ant's samples for identification from The Israel Nature and National Parks, The Ministry of Environmental Protection and from different exterminators.

Collecting trips and expeditions

Constituting 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.

Ichthyological Laboratory

Menachem Goren

In January 2008 we began a research on “The impacts of biological invasions and climate change on the biodiversity of the Mediterranean Sea”. The project is being carried out within a cooperative framework between the Porter School of Environmental Studies and the Italian Ministry of the Environment, Land and Sea. The project is coordinated by M. Goren (TAU) in cooperation with B. Galil and A. Diamant (ILOR). As part of the research we have carried out to date seven collection cruises along the Israeli coast of the Mediterranean and in Antalya and Iskenderun Bay (Turkey,) where we enjoyed the collaboration of Dr.

Baki Yokes and his students and the invaluable help of local fishermen. Hundreds of thousands of specimens were sorted and examined and many have been preserved and deposited in the collections of fishes and invertebrates. Unfortunately, the extreme shortage of space in the collection halls has severely limited our ability to retain a sufficient number of samples.



Benthic biodiversity surveys off the Mediterranean coast of Israel

Bella S. Galil

In 2008 eight campaigns were conducted off the Mediterranean coast of Israel in order to sample the benthic biota. Bella Galil, Mel Cooper, Limor Shoval, Eva Mizrahi, and Guy Paz participated in the cruises that took place aboard the R/V Shikmona and Etziona of the National Oceanographic Institute, IOLR. The surveys were conducted as part of baseline studies or monitoring surveys (off Palmahim, 05.2008, 09.2008, 37m depth, box core and trawl samples; off Ashdod, 05.2008, 12m depth, box core samples; 05.2008, 12 m depth, box core samples; off the coastal streams, 08.2008, 7-15 m depth, grab samples). The macrofaunal samples – several hundred specimens – include rare records for the Israeli coast and new records of alien species (in press).

The material is housed in the Natural History Collections, Department of Zoology, Tel Aviv University, Israel

Collecting trips by the Entomologists

Amnon Freidberg and Ariel-Leib-Leonid Friedman

Cyprus. In early April, 2008, Leonid Friedman and I traveled to Cyprus for a few days. The main aim of this trip was to study a new species of a pictured-wing fly of the genus *Dorycera* (Ulidiidae) that had been discovered as an endemic of Cyprus several decades ago, and of which I'd managed to collect only a single female during my first visit to the island, two years earlier. *Dorycera* is a primarily Mediterranean genus, which was revised several years ago by my M.Sc. student, Hanan Ackerman. This revision has not yet been published, partly because I wanted this new endemic species also to be represented by TAU specimens. The species was represented (in other collections) from various localities throughout the island, and it was collected in late March and April.

We landed in Larnaka in the evening. The next morning, having rented a car, we drove toward the mountains not far from Larnaka (to an area in the eastern part of the Greek territory from which specimens had been collected before) and were immediately struck by the extreme dryness caused by several successive periods of draught. Needless to say, we found no *Dorycera* and indeed very few insects. I was ready to go back home, but we decided to give ourselves another chance. The next day we met a colleague, Mr. Chrystodoulus Makris, whose home was a village located at a relatively high elevation of the central mountains. We drove from Limassol up the mountains, stopping at about 300m altitude at a place suggested by Christodoulus. This location had a much greener and lush vegetation than the location at the same altitude that we had visited the previous day. After about an hour of collecting, and despite the good diversity of various insect groups, I still considered that we should return home. It was exactly then that I saw Leonid from some distance dancing on the slope. As we approached he yelled out that he has found the species we were looking for, and he was right! He did have two specimens of this handsome species (see illustration).



With renewed energy the three of us resumed our search, and indeed we ended up with about 20-30 specimens. To celebrate this success we drove to Christodoulus home village, where we visited his elderly parents, were invited for a tasty lunch prepared by his mother, and ended up at a winery that he had designed (he is a professional architect and an amateur entomologist). During the remaining two days we returned twice to the same site (near the village of Nata) and collected additional specimens, altogether over 100. It is interesting to note that most of the specimens were found on a relatively arid slope of that hill and not in the anticipated area of the most lush vegetation. I am grateful to both my colleagues for their help, without which I would not have been able to obtain this nice series of *Dorycera* species.

Israel. A sampling of the insect fauna was performed on 18 March.2008 in the Umm-Zuqa Reserve, situated partly in the Jordan Valley and partly on the slopes of East Samaria. This was carried out upon the request of the Israel Nature and Parks Authority. Several rare species of Diptera, Coleoptera and Formicidae were collected and recorded, including three species of beetles new to the Jordan Valley.

Africa. A trip to East Africa (Ethiopia and Kenya) and Madagascar was carried out in October-November 2008, in order to study and collect material for the National Collection of Insects. The participants were: Dr. Amnon Freidberg, Mrs. Liat Gahanama (both working on Diptera) and Mr. A.-L.-Leonid Friedman (working on Curculionoidea). The main goal of the trip was Liat's PhD, working on the taxonomy, systematics and biology of schistopterine fruit flies. It was the second trip dedicated to this study, and it focused on the Schistopterini fauna of Madagascar.

There is no direct flight connection between Israel and Madagascar, so we (Amnon and Leonid) flew to Nairobi via Addis Ababa, and stayed in Nairobi while waiting for the flight to Antananarivo (Tana). In Kenya we spent a full day in the Karura Forest, Nairobi, collecting much good material, including many rare species of fruit flies and weevils, not represented previously in the Israel National Collection. The next day we flew to Madagascar and started a series of meetings with organization mediating between the local nature preservation organizations and foreign researchers. Natural habitats in Madagascar are in a very bad state: almost entirely destroyed in the central part of the island, and damaged severely in other parts. The last existing patches of natural landscapes have been declared as reserves in the last 10-15 years, and any research activity, including collecting, in those areas requires special permits from the authorities. It takes at least half a year to obtain a permit, which is specific to a particular reserve and sets out many conditions. In Tana we met Liat, who had come via Paris, and a local student, Mr. Tefiarisoa Zelin Ratovonomenjanahary (nicknamed "Tefy"), who participated in all our

excursions based on the conditions set by MICET and other authorities. We soon discovered him to be a very pleasant fellow and also very useful for us, as he spoke English, French and Malagasy. He greatly helped us in finding our way, shopping and talking with the locals.

During our 3-week stay in Madagascar collecting trips were made to the following regions:

1. The dry semi-desert area in the south-east of the island (Fort-Dauffin, Berenty); the collecting took place mostly in the dry savanna-like landscape, but also in the mountain rainforest of Isaka. Most of Liat's research was carried out in this area: two new species of *Schistopterum* were found and collected, and some behavioral observations were made on them and on *Bactropota* sp.

2. The rainforest of Ranomafana (the collecting was unpleasant and not productive here, due to the frequent rain).

3. The rainforest of Andasibe (Perinet). The collecting was very productive, although we were deceived by the authorities: Despite having paid for a permit for collecting INSIDE the reserve, we were given a permit to collect only OUTSIDE of the reserve. However, we found a forest research station, managed by a German ecologist, Dr. Reiner, who allowed us to collect in the Analamazaotra Forest, adjacent to the reserve.

4. We performed a very fruitful collecting in the Tsimbazaza Botanical and Zoological Garden, inside Tana, which is actually the last area of more or less un- destroyed nature in the central part of Madagascar. We made a short visit to the National Entomological Collection of Madagascar, and briefly studied part of the collection of weevils.

Results of the collecting on Madagascar:

Beetles (Coleoptera): 3,101 specimens belonging to at least 800 species were collected, 585 determined at least to the rank of family, including 196 species

of weevils (Curculionoidea) (1701 specimens) and 226 species of leaf-beetles (Chrysomelidae) (712 specimens).

Diptera: A similar number of specimens, including about 50 species of fruit flies (Tephritidae), many of which are undescribed, and several had not been represented in our collection before (AF had previously collected on Madagascar in 1991). Several species were reared from host plants. Many specimens of other Diptera families were collected, including *Margo* sp. (Marginidae) and *Nemula longarista* (a genus and species described by Amnon), taxa restricted to the Island and whose genes are now being sequenced.

Around 2,000 specimens of insects from other orders were collected, particularly Hemiptera (bugs and cicadas) and Hymenoptera (bees, wasps and ants).

While Liat returned to Israel, we continued on to Ethiopia. We had a half day connection in Nairobi during which we had four hours of good collecting in the nearby Ngong Hills, resulting in around 20 species of fruit flies and around 20 species of beetles. We landed in Addis Ababa at night, spent the entire next day looking for a vehicle, and left the city in the evening. One of our main destinations in Ethiopia was the ancient city of Harar in the eastern part of the country. During that week we collected in the Rift Valley, including the Awash area and the Awash National Park; in the Ahmar Mountains; in and around Harar; and east of Harar. In addition to insect collecting we observed the unique custom of the feeding of wild spotted hyenas in Harar, and several species of wild ungulates (oryx, Soemmerring's gazelle and kudu) in the Awash National Park. We also visited a small but interesting museum of the wildlife of Awash in the Awash NP, which exhibited stuffed mammals and birds, skins, heads and parts of skeletons.

The collecting in Ethiopia resulted in around 100 species of flies, including about 50 species of fruit flies (Tephritidae); around 150 species of beetles and about 100 species of other insects. Although this material is still not completely sorted, we can point out among the collected materials two undescribed species of *Bengalia* (Diptera; Bengaliidae) and a series a species belonging to the rarely collected primitive genus *Apiomorphus* (Coleoptera; Curculionoidea; Apionidae).

Activity report: October 1, 2007-September 30, 2008

Yehuda Benayahu

1. Comprehensive collections of soft corals were conducted La Reunion (Indian Ocean) during April 2008. Over 140 samples were collected in various reef sites and habitat there. This was the first ever conducted soft coral survey in this remote island. The collection comprised ca 25 species, including 4 new ones that wait for taxonomic description.
2. Bases on a collection conducted in Hong Kong in December 1999 which deposited at the Natural History Collections, Tel Aviv University, three new species of soft corals were described. The new species belong to the genera *Paraminabea*, *Sarcophyton* and *Lobophytum*. Two publications that summarized the finding of this survey were submitted for publication.
3. During a visit to Paris Museum of Natural History (December 2007) I examined all type material of the soft coral genus *Cladiella* which is deposited there. All types were photographed. Samples were removed from the type material and later used for preparation of permanent slide mounts to be used as reference while identifying material of that genus. All slides (>120) are deposited at the Natural History Collections, Tel Aviv University,.

Collecting in the Netherlands and a visit to the Zoological Museum of Amsterdam

Henk K. Mienis

In September 2008 I again spent a month in my native Netherlands. Besides visiting my family, most of the time was used for fieldwork for the project "Mapping of the Molluscs in the Netherlands". This work was mainly accomplished in the province of North Holland and on one of the Wadden Sea islands, Terschelling, in the province of Friesland.

Although in general I collect land and freshwater molluscs, this time my main interest was focused on the presence and distribution of invasive molluscs. This has already led to the publication of about 15 installments in the series "Strangers among the land snails of Terschelling", as well as numerous additional faunistic notes on the distribution of other exotic molluscs in the Netherlands.

This autumn 50 localities were sampled on Terschelling and 44 localities elsewhere, mainly in North Holland. Part of the preserved material and empty shells are now housed in the National Mollusc Collection of Tel Aviv University. They are intended to serve as tools for the identification of snails intercepted by inspectors from the Plant Protection & Inspection Services of the Israeli Ministry of Agriculture and Rural Development, on agricultural and horticultural products arriving in Israel, mainly via the international flower market in Aalsmeer, Netherland. A small part of the collected material found its way to the Department of Malacology, at the Zoological Museum of Amsterdam, of which I am an Honorary Associate.

This year we were able to solve problems connected with the sudden appearance of two invasive freshwater gastropods on Terschelling. The presence of *Haitia acuta* (Draparnaud, 1805) was traced to a local garden center, where all the aquatic plants, "imported" from the mainland, turned out to be

heavily infested with this North American snail. The recent finds of *Ferrissia clessiniana* (Jickeli, 1882), a tiny limpet-like snail originally described from the Nile delta in Egypt, was traced to the recent planting of water lilies (*Nymphaea alba*), an exotic species for this island, in aquatic habitats which had been previously devoid of any molluscs.

In North Holland many new localities of the invasive species *Hygromia cinctella* (Draparnaud, 1801), a Western-Mediterranean land snail, were registered in Purmerend, a small town north of Amsterdam.

In addition, four fortifications belonging to a former defense line encircling Amsterdam and officially placed on the list of historical heritages recognized as such by UNESCO, were surveyed for the presence of molluscs. All these fortifications are declared nature reserves and are usually not open to the public. Publications of the results are in preparation.

Three days were spent at the Zoological Museum of Amsterdam, where the excellent malacological library there was used in order to solve certain problems concerning the taxonomy and nomenclature of some marine molluscs from the Red Sea. Their extensive collections were also consulted in order to compare material from the Red Sea with similar species living in the Indo-Pacific.

I would like to thank the Dutch "Society for Nature Monuments" and the "State Forestry Service" for giving me permission to carry out a mollusc survey on the fortifications falling under their jurisdiction. I also thank my friend and long-time colleague Robert G. Moolenbeek for his hospitality at the Zoological Museum of Amsterdam.

2nd National Malacology Congress of Turkey in Adana including a collecting trip

Henk K. Mienis

I was recently invited to participate in the 2nd National Malacology Congress of Turkey, which took place at Çukurova University in Adana from 8-10 October 2008. The congress was intended to give Turkish zoologists working on molluscs an opportunity to present the results of their studies to an audience of people with similar interests. For some of the students the congress provided a first chance to present their malacological studies. It also provided an opportunity to exchange ideas with colleagues and fellow students.

I was honored to present the opening lecture: "Exotic freshwater molluscs in Israel", on the first day of the congress. During this congress several participants reached various agreements to establish international cooperation or to intensify the existing contacts. Before, during and after the congress I used the opportunity to collect molluscs from 17 different localities. This material now forms part of the Mollusc Collection of the National Collections of Natural History of Tel Aviv University.

The following localities were sampled:

1. Vilayet Adana, Adana, Campus Çukurova University, garden and parkinglot near the guesthouse, 07.10.2008 [37° 03' 25.19" N 35° 21' 05.50" E].
2. Vilayet Adana, Adana, Campus Çukurova University, T-junction 100 m north of the guesthouse, 11.10.2008 [37° 03' 28.12" N 35° 21' 10.30" E].
3. Vilayet Adana, Adana, Campus Çukurova University, in garden of the Dept. Fisheries, 07.10.2008 [37° 03' 36.57" N 35° 21' 15.31" E].
4. Vilayet Adana, Adana, Campus Çukurova University, Seyhan Lake, Balcali side, near restaurant of the marina, 11.10.2008 [37° 02' 48.10" N 35° 20' 38.90" E].
5. Vilayet Adana, Adana, Campus Çukurova University, Seyhan Lake, Balcali side, 200 m north-west of the marina, 11.10.2008 [37° 02' 55.77" N 35° 20' 34.35" E].
6. Vilayet Adana, Adana, Campus Çukurova University, Seyhan Lake, Balcali side, ± 500m north-east of the marina, 11.10.2008 [37° 02' 53.59" N 35° 20' 45.24" E].

7. Vilayet Adana, Yumurtalik, Marine-Biological Fisheries Station, in garden on very large flowerbox 10.10.2008 [36° 45' 42.12" N 35° 42' 55.50" E].
8. Vilayet Adana, Yumurtalik, Marine-Biological Fisheries Station, between shrubs near the beach, 10.10.2008 [36° 45' 38.85" N 35° 42' 50.25" E].
9. Vilayet Adana, Yumurtalik, Marine-Biological Fisheries Station, in drift on the beach, 10.10.2008 [36° 45' 41.39" N 35° 42' 59.01" E].
10. Vilayet Adana, Yumurtalik, \pm 1 km west of the Marine-Biological Fisheries Station, in tiny saltswamp, 10.10.2008 [36° 45' 32.84" N 35° 42' 36.81" E].
11. Vilayet Adana, Yumurtalik, \pm 1 km west of the Marine-Biological Fisheries Station, on stony slope of a hill near the sea, 10.10.2008 [36° 45' 33.42" N 35° 42' 35.03" E].
12. Vilayet Adana, Yumurtalik, in drift on the beach just east of the archaeological site, 10.10.2008 [36° 46' 10.49" N 35° 47' 29.97" E].
13. Vilayet Adana, Yumurtalik, in garden of the Agricultural Highschool of the Çukurova University, 10.10.2008 [36° 46' 37.75" N 35° 47' 33.89" E].
14. Vilayet Adana, Yumurtalik Lagoon, near Deveciuşığı Dalyan, saltswamp and lagoon, 10.10.2008 [36° 44' 47.87" N 35° 38' 05.95" E].
15. Vilayet Adana, Karatas, Magarsus Hotel of the Dept. of Tourism and Hotel Management of the Çukurova University, in garden, 10.10.2008 [36° 35' 45.03" N 35° 26' 29.22" E].
16. Vilayet İçel, Mersin, in garden along the boulevard, 12.10.2008 [36° 46' 48.70" N 34° 36' 05.57" E].
17. Vilayet İçel, Mersin, in drift on the beach east of the sight-seeing jetty, 12.10.2008 [36° 46' 47.33" N 34° 36' 09.79" E].

To date, only the land and freshwater molluscs have been identified. A land snail, *Xerolenta obvia* (Menke, 1828), Fam. Hygromiidae, was recorded for the first time from two localities in the Vilayet Adana: Adana (loc. 1) and Yumurtalik (loc. 8). Of the freshwater mussel *Dreissena iconica* Schütt, 1991, only known so far from fossil specimens, fresh empty valves were found in drift of the Seyhan Lake near Çukurova University.

New collections

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 very important 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.

- 2001- Tobias Landau Foundation. Research project: Colonization of artificial reefs in Elat (Red Sea) (Y. Benayahu). -20% allocated for collections-based research.
- 2002- On-going grant from the Nature and Parks Authority to "rescue" insects on the Golan and Hermon (V. Chikatunov and A. Freidberg).
- 2004-2007 USAID-CDR, Research Project: Scientifically based framework for conserving and monitoring the Eritrean coral-reefs (Y. Benayahu).
- 2005-2007 Grant from the USDA (and other donators) to develop the Parasitica collection (D. Gerling).
- 2005-2007 International Arid Lands Consortium (IALC) (\$100,000) (E. Geffen and G. Roemer).
- 2005-2007 Porter School of Environmental Studies in collaboration with the Italian Ministry of the Environment: Artificial Marine Structures (AMS): Multifunctional Tool for Research and Environmental Management in the Mediterranean and Red Sea (MED- RED) (Y.

Benayahu, Y. Loya and A. Abelson) -20% allocated for collections-based research.

- 2005-2008 GLOWA Jordan River research grant: Modeling the impact of global climate change on terrestrial biodiversity in the Jordan River Basin: Testing planning scenarios and climate change scenarios (3 year grant; ca. EURO 35,000 per annum) (T. Dayan, P.I. of subproject).
- 2005-2008 Israel Science Foundation: The Emergence of Stone Beads at the Dawn of Farming: Raw Materials, Technology, Chronology and Exchange (Bar-Yosef Mayer, D.E.).
- 2005-2008 Ministry of Agriculture, Milk Board grant to work on *Atherigona soccata*, a pest of sorghum (3 years) (A. Freidberg).
- 2005-2008 Yad Hanadiv: The Emergence of Stone Beads at the Dawn of Farming: Raw Materials, Technology, Chronology and Exchange (Bar-Yosef Mayer, D.E.).
- 2005-2009 The Israel Science Foundation (488/05); 4 years. Vocalization as an indicator of individual quality in the rock *hyrax* (\$180,000) (O. Mokady, E. Geffen and M. Kam).
- 2006- 2010 Sponge (Metazoa: Porifera) phylogenetics using novel molecular markers. The Israel Science Foundation (NIS 270,000 per year). (D. Huchon).
- 2006- 2010 Sponge (Metazoa: Porifera) phylogenetics using novel molecular markers. The Israel Science Foundation (NIS 270,000 per year). (D. Huchon).
- 2006-2007 Government Advertising Agency – Lapam (P.I). For developing Nature's Resources on the Web (150,000 NIS ca. \$35,000) (Y. Gavrieli).
- 2006-2007 Has habitat fragmentation and rainpools geographic distance caused genetic variation among populations of the Syrian spadefoot toad *Pelobates syriacus syriacus* in Israel? Israel Nature Reserve and Parks Authorities. 80,000 NIS (S. Gafny and A. Freidman).
- 2006-2007 Mekorot. Bio-management of water quality in reservoir (M. Goren).
- 2006-2007 The effect of aquatic recreation activity on macroinvertebrate and fish assemblage in water bodies of the Hula Valley. Israel Nature

- Reserve and Parks Authorities. 80,000 NIS (S. Gafny and M. Goren).
- 2006-2008 Bridging the Rift Foundation research grant. Biodiversity in human-dominated landscapes in the Arava Rift Valley \$50,000 (T. Dayan and Y. Mandelik).
- 2006-2008 German-Israeli Foundation for Scientific Research and Development grant: Patterns of biodiversity in natural and cultural landscapes: a model Mediterranean forest ecosystem (3 year grant; total sum EURO 158,000) (T. Dayan and T. Assmann).
- 2006-2009 Israel Science Foundation research grant. Animal bones, ancient populations, and site formation processes: A test case of Dor, a coastal Levantine site (3 year grant; 225,000 NIS [ca. \$50,000] per annum) (T. Dayan and G. Bar-Oz C.I.)
- 2007 Ministry of Environment (P.I.). For developing website content on invasive species. 18,000 NIS (\$5,200) (Y. Gavrieli).
- 2007 Nature Reserves Authority. The Feasibility assessment of restoration of the endangered loach- *Nemacheilus dori* (M. Goren).
- 2007 Nature Reserves Authority. The impact of tourism on aquatic biota (M. Goren).
- 2007- 2009 Phylogenomics of Urochordata and its application for detecting evolutionary shifts in vertebrate proteins. MOST - The High Council for Scientific and Technological Cooperation between France-Israel (NIS 108,750 per year). (D. Huchon and E. J. P. Douzery).
- 2007 CARE Archaeological Foundation: Insight into Hunter-Gatherers' Life: The Role of *Dentalium* Shells in Late Epipalaeolithic Sites of the Levant (Bar-Yosef Mayer, D.E.).
- 2007 Charles And Lynn Schusterman Family Foundation (P.I). For developing natural History Museum On-Line. (\$66,000 ca. 278,000 NIS) (Y. Gavrieli).
- 2007 Fingerhot Karol and Lionora foundation: The role of ligamentum flavum in Spinal stenosis (I. Hershkovitz)
- 2007 Yad Avi Ha'Yishuv Foundation (P.I). For "Environmental scientists and environmental policy-makers – discourse assessment and action recommendations". \$53,000 (218,600 NIS) (Y. Gavrieli).

- 2007/2008 Ministry of Science, Culture & Sport research grant ("Biodiversity in agro-natural landscapes: Maintaining biodiversity and pollination services in arid ecosystems") (1 year grant; 175,000 NIS [ca. \$40,000]) (T. Dayan and A. Hefetz C.I.)
- 2008 Dan David prize to outstanding post-doctoral students of exceptional promise given for the future time dimension in the field of geosciences (Shenkar, N.).
- 2008 Grant from the USDA to collecting and identifying the insects on *Arundo donax* (D. Gerling).
- 2008 Misliya cave project: Dan David Foundation (I. Hershkovitz).
- 2008 The root of violence: Israel Palestinian Science Foudation (I. Hershkovitz).
- 2008 The structure and function of the vertebral epiphyseal ring: Israel Science Foundatio (I. Hershkovitz).
- 2008-2010 Israel-Italy R&D project. The impacts of biological invasions and climate change on the biodiversity of the Mediterranean Sea (Goren, M. and Galil, B.).

Graduate students

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

PhD students

- 1999-2008 Liora Glass (E. Geffen and T. Dayan)
The ecology of jungle cats in natural and anthropogenic habitats in Israel.
- 2002- Hadass Schteinitz (Y. Yom-Tov and T. Dayan)
Estimating the effect of global warming on the distribution of Israeli animals.
- 2003- B. Bahaa (I. Hershkovitz)
Macro and microstructure of the annulus fibrosus.
- 2003-2008 Noa Shenkar (Y. Loya)
Bioactivity of Mediterranean and Red sea tunicates.
- 2003- Merav Weinstein (T. Dayan and A. Hefetz)
Invasive ants of Israel.
- 2004- G. Dar (I. Hershkovitz)
Spondyloarthropathy.
- 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- Motti Charter (Y. Leshem)
- 2005- Yaron Krotman (M. Goren)
Fish biodiversity and ecology in oasis habitats in the Dead Sea Valley.

- 2005- Tal Levanony (T. Dayan)
Patterns of biodiversity in natural and cultural landscapes: A model Mediterranean forest ecosystem.
- 2005- Ofir Levy (T. Dayan and N. Kronfeld-Schor)
Modeling climate effects on temporally-partitioned rocky desert rodents: From basic principles to community structure.
- 2005- Amy Shlesinger (Y. Loya)
Predator-prey interactions between nudibranchs and their sea-anemone prey.
- 2005- Orit Skutelsky (T. Dayan and E. Feitelson)
Biodiversity conservation in biosphere reserves of Israel: The switch from a market led to conservation oriented agriculture.
- 2005- Assaf Zevoluni (Y. Loya)
Coral community dynamics in bleached and non-bleached coral reefs (Zanzibar vs. Elat).
- 2006- Frida Belinky (D. Huchon and A. Lotem)
Multiple approaches to solve basal metazoan phylogeny and its implication on intron evolution.
- 2006- O. Hai (I. Hershkovitz)
Spinal evaluation in Lower Back Pain.
- 2006- Eran Levin (Y. Yom-Tov and N. Kornfeld).
Ecophysiology of free-tailed bats.
- 2006- Lidar Sapir-Hen (T. Dayan and G. Bar-Oz, University of Haifa).
Animal bones, ancient populations, and site formation processes: A test case of Dor, a coastal Levantine site.
- 2006- R. Sarig (I. Hershkovitz)
Interproximal attrition.
- 2007- Y. Aluma (M. Ilan)
Environment impact on sponge-fungi association.
- 2007- Emmanuelle Cohen-Shacham (T. Dayan)
Policies for managing ecosystem services
- 2007- Ronit Justo-Hanani (T. Dayan)

- Legal and administrative aspects of genetically modified organisms in Israel.
- 2007- Aldona Kurzwaska (Bar-Yosef Mayer, D.E. and M. Kobusiewicz)
Insight into Hunter-Gatherers' Life: The Role of Dentalium Shells in Late Epipalaeolithic Sites of the Levant.
- 2007- Amir Shitenberg (D. Huchon and M. Ilan)
Phylogeny and evolution of demosponges.
- 2008- J. Abass (I. Hershkovitz)
- 2008- Ariella Gotlieb (T. Dayan and Y. Mandelik)
Agriculture and conservation in the Arava Valley
- 2008- H. May (I. Hershkovitz)
- 2008- Noa Sokolover (M. Ilan)
Bryozoans ecology

MSc students

- 2003-2008 Shunit Gal (D. Gerling)
Variations within a species - *Bemisia tabaci* (due to parasitic bacteria).
- 2004- Haim Biala (V. Soroker, The Agricultural Research Organization of Israel)
Ants associated with banana aphids.
- 2004- 2007 Michal Meir (A. Freidberg and M. Sternberg)
Flower color variation in the thistle, *Syllibum marianum*.
- 2004- Adi Ramot (E. Groner and P. Bar, Ben Gurion University)
- 2004- 2008 Shachar Samra (A. Freidberg and D. Gerling)
Biology and taxonomy of selected Parasitica (Hymenoptera).
- 2004- Daniel Yashunski (M. Goren)
Succession of fish community in planted corals in Elat.
- 2005-2008 J. Abass (I. Hershkovitz)
Ligamentum flavum and spinal stenosis.

- 2005- Kfir Gaier (M. Goren)
The impact of grazing fish on invertebrate communities in eastern Mediterranean.
- 2005-2008 Gali Gingold (Y. Yom-Tov and E. Geffen)
The effect of dogs on gazelles in the Golan Heights.
- 2005- Michal Grosovich (Y. Benayahu)
Habitat partitioning of three azooxanthellate soft corals in Elat (northern Red Sea).
- 2005- Nimrod Lazarus (Y. Loya)
Induction of metamorphosis in nudibranch larvae.
- 2005-2008 Mustafa Mahagna (D. Gerling)
Identity of the whitefly *Aleurolobus marlatti* in Israel and its relationship with *A. niloticus*.
- 2005- Osnat Maor (M. Goren)
Reproductive biology the cyprinid fish *Garra rufa* in the Jordan River basin.
- 2005-2008 H. May (I. Hershkovitz)
Hyperostosis Frontalis Interna.
- 2005-2007 Yona Levin (Bar-Yosef Mayer, D.E. and E. Spanier)
The Genetic Structure of the Green Turtle (*Chelonia mydas*) Population along the Mediterranean Coast of Israel, and Interactions between Human and Marine Turtle in Ancient Civilizations.
- 2005-2008 Erez Maza (T. Dayan)
Climate and land-use patterns in biodiversity.
- 2005- Oren Shelef (E. Groner and M. Shachak, Ben Gurion University)
- 2005- Tamir Shelhav (E. Groner and M. Shachak, Ben Gurion University)
- 2005- Ina Stierberg (T. Dayan)
Climatic gradients in biodiversity.
- 2005-2008 Rafi Yaabetz (Y. Loya)
Reproductive cycle of a nudibranch.

- 2005- Kineret Yoktan (Y. Yom-Tov)
Phylogeography of the orange-tufted Sunbird *Nectarinia osea*.
- 2006- Z. Kochva (M. Ilan)
Sponge associated bacteria and their role in production of natural products.
- 2006- Tali Kuperman (I. Hershkovitz)
Pottery Neolithic populations.
- 2006- Bat Sheva Rotman (M. Goren)
The biology the balitorid fish *Nemacheilus jordanicus* in the Jordan River basin.
- 2006- Karin Tamar (T. Dayan).
Archeozoology of Tel Bet Shemesh.
- 2006- G. Tirosh (M. Ilan)
Sponge community in the Israeli Mediterranean coast.
- 2006- Michal Weis (Y. Benayahu)
Bivalves as colonizers of artificial marine structures at Eilat (Red Sea).
- 2007- Hagit Alphandary (M. Goren and Prof. Henig)
Analysis of decision making process in the case of Kishon River
- 2007- Hagar Ben-Bassat (Bar-Yosef Mayer, D.E. and A. Gilboa)
Beads and Pendants at Tel Dor During the Early Iron Age: Origin, Technology and Social Perspectives.
- 2007- Nir Ezra (D. Huchon)
Phylogeny and evolution of the demosponge family Poecilosclerida.
- 2007- Slava Feldman (Bar-Yosef Mayer, D.E. and S. Shalev)
Connections between Cyprus and the Levant during the Pre Pottery Neolithic B based on beads movements.
- 2007- Tamar Marcus (T. Dayan)
Spatial aspects of climate change and conservation.
- 2007- Dafna Meirovich (Y. Benayahu)
Soft corals of the family Xeniidae at Eilat.

- 2007- Naomi Shifris (Bar-Yosef Mayer, D.E. and A. Gilboa)
The Phoenician Iron Age II bead assemblage: The Achziv Cemeteries as a Test case.
- 2007- Miri Taub (Goren, M.)
The impact of recreation activity on the biota in inland aquatic habitats.
- 2008- Matan Ben Ari (D. Gerling)
Bionomics of the whitefly *Dialeurolobus rhamni* in the Judean hills.
- 2008- Roni Lee (Goren M.)
Comparative study of reproductive aspects of invaders and native fish in Eastern Mediterranean.
- 2008- Y. Paker (Y. Yom-Tov, A. Barnea and T. Alon-Mozes)
The wildlife in urban gardens
- 2008- Ittai Renan (A. Freidberg and P. Bar-Yekutiel)
The effect of dune stabilization on arthropod communities in the Western Negev
- 2008- D. Stein (I. Hershkovitz)
3D-Reconstruction of the vertebral epiphyseal ring.

Post-doctoral fellows

- 2008-2009 Efrat Gavish-Regev (T. Dayan)
- 2008- Noa Shenkar (Y. Loya)

Visiting scientists at the National Collections

The attached list includes visitors from institutions **other than** Tel Aviv University collection's staff 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 personally. 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
2007 Oct	J. A. Byers	US Arid-Land Agricultural center, USDA-ARC, Manicopa,	Arizona USA	Entomology
2007 Oct	A. Abu Ras	Hebrew University	Israel	Fish
2007 Nov	E. van den Brik	Israel Antiquity Authority	Israel	Molluscs
2007 Dec	O. Hazofe	Israel Nature and Parks Authority	Israel	Birds
2007 Dec	D. Rotem		Israel	Mammals
2007 Dec	E. Sheffer	IOLR - Haifa	Israel	Molluscs
2007 Dec	I. Ktalav	Israel Antiquity Authority	Israel	Molluscs
2008 Jan	Z. Brosh	Israeli Air Force	Israel	Birds
2008 Jan	Channel 1	Israeli T.V.	Israel	Birds
2008 Jan	O. Tal	Tel Aviv University	Israel	Molluscs
2008 Feb	Z. Ben-David	PPIS, Ministry of Agriculture	Israel	Entomology
2008 Feb	G. Sabatinelli	University of Rome	Italy	Entomology
2008 Feb	Z. Brosh	Israeli Air Force	Israel	Birds
2008 Feb	I. Poner-Koks		Israel	Birds

Date	Name	Institute	Country	Taxonomic group
2008 Feb	O. Ritner	Tel Aviv University	Israel	Mammals, Birds
2008 Feb		Bird Watching Center	Israel	Birds
2008 Mar	D. W. Wrase		Germany	Entomology
2008 Mar	G. Wagner		Germany	Entomology
2008 Mar	D. Kasparyan	Zoological Institute, St. Petersburg	Russia	Entomology
2008 Mar	M. Gros	Tel Aviv University	Israel	Mammals
2008 Mar	Z. Brosh	Israeli Air Force	Israel	Birds
2008 Mar	S. Kislev	Petach Tikva Museum	Israel	Mammals, Birds
2007 Mar	U. Galili	Israel Antiquity Authority	Israel	Molluscs
2008 Mar	M. Tom	IOLR - Haifa	Israel	Fish
2008 Apr	D. Kasparyan	Zoological Institute, St. Petersburg	Russia	Entomology
2008 Apr	S. Patiny	Gembloux University	Belgium	Entomology
2008 Apr	N. Dorchin	Museum Koenig, Bonn	Germany	Entomology
2008 Apr	Z. Brosh	Israeli Air Force	Israel	Birds
2008 Apr	E. Shani	Society for the Protection of Nature in Israel	Israel	Birds
2008 May	S. Patiny	Gembloux University	Belgium	Entomology
2008 May	Z. Brosh	Israeli Air Force	Israel	Birds
2008 May	Z. Orlin	I.M.S.	Israel	Molluscs
2008 Jun	G. Sabatinelli	University of Rome	Italy	Entomology
2008 Jun	A. Haber	University of Chicago	USA	Mammals
2008 Jun	E. Spanier	Hebrew University	Israel	Crustaceans
2008 Jun	Y. Chakra		Israel	Mammals
2008 Jun	O. Hazofe	Israel Nature and Parks Authority	Israel	Birds
2008 Aug	L. Rybalov	Russian Academy, Moscow	Russia	Entomology

Date	Name	Institute	Country	Taxonomic group
2008 Sep	L. Rybalov	Inst. of Ecology and Evolution, Russian Academy, Moscow	Russia	Entomology
2008 Sep	L. Rybalov	Inst. of Ecology and Evolution, Russian Academy, Moscow	Russia	Entomology

Support for academic and other courses

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

Purpose	Name	Institute	Taxonomic group
Insects the Flagship of Biodiversity (academic course)	A. Freidberg and D. Simon	Tel Aviv University	Entomology
Faunistica (academic course)	Z. Arad	Technion	Birds, Mammals and Museum Class
Vertebrates Anatomy (academic course)	D. Eilam, M. Ovadia and U. Oron	Tel Aviv University	Reptilia, Mammals and Taxidermist
Animal Behavior	I. Golani	Tel Aviv University	Mammals and Museum Class
Introduction to Animal Kingdom: Invertebrates and Vertebrates (academic course)	M. Ovadia and A. Gasith	Tel Aviv University	Mammals and Entomology
The Invertebrates: Comparative Functional Biology (academic course)	M. Ilan, Y. Benayahu and A. Abelson	Tel Aviv University	Invertebrates, Entomology and Histology
Human Evolution: fossil evidences (academic course)	Y. Rak	Tel Aviv University	Anthropology
Osteology And Anthropology (academic course)	I. Hershkovitz	Tel Aviv University	Anthropology

Purpose	Name	Institute	Taxonomic group
Physical Anthropology (academic course)	Y. Rak	Tel Aviv University	Anthropology
Chapters in Human Evolution (academic course)	Y. Rak	Tel Aviv University	Anthropology
Ichthyology (academic course)	M. Goren	Tel Aviv University	Fishes and Museum Class
Biology and Systematic of Marine Invertebrates: (academic course)	Y. Benayahu	Interuniversity Institute for Marine Sciences	Invertebrates
Guiding Students	D. Bar-Yosef	University of Haifa	Molluscs
Guiding Students	G. Bar-Oz	University of Haifa	Mammals and Museum Class
wild bee taxonomy and ecology	S. Patiny	Faculty of Agriculture, Food and Environment	Entomology
Bird-Watching	T. Shariv	Avshalom Institute	Birds and Museum Class
Bird-Watching		Israeli Air Force	Birds and Museum Class
Various seminars	Elat District	Israel Nature and Parks Authority	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	PPIS of the ministry of Agriculture	Entomology
Taxonomy Identification		Plant Protection and Inspection Services	Entomology
Taxonomy Identification		Israel Nature and Parks Authority	Entomology
Taxonomy Identification		Ministry of Environmental Protection	Entomology
Taxonomy Identification		Ministry of Helth	Entomology
Taxonomy Identification	A. Gasith	Tel Aviv University	Entomology and Invertebrates
Taxonomy Identification	E. Nevo & T. Pavlicek	University of Haifa	Entomology
Taxonomy Identification	U. Shanas	Oranim Academic College	Entomology
Taxonomy Identification	E. Groner	Ben-Gurion University of the Negev	Entomology
Taxonomy Identification	M. Golan	Ben-Gurion University of the Negev	Entomology
Taxonomy Identification	O. Shelef	Ben-Gurion University of the Negev	Entomology

Purpose	Name	Institute	Taxonomic group
Taxonomy Identification	E. van dan Brink	Israel Antiquity Authority	Molluscs
Taxonomy Identification	U. Galili	Israel Antiquity Authority	Molluscs
Taxonomy Identification	T. Oron	Israel Nature and Parks Authority	Molluscs
Taxonomy Identification	S. Moran	Plant Protection and Inspection Services	Molluscs
Taxonomy Identification	E. Sheffer	IOLR - Haifa	Molluscs
Taxonomy Identification	Z. Orlin		Molluscs
Taxonomy Identification	North Distric	Israel Nature and Parks Authority	Fishes
Taxonomy Identification	I. Zohar	Tel Aviv University	Fishes
Taxidermist services	D. Eilam	Tel Aviv University	Birds, Mammals and Taxidermist
Taxidermist services	A. Lotem	Tel Aviv University	Birds and Taxidermist
Taxidermist services	Y. Leshem	Tel Aviv University	Birds and Taxidermist
Taxidermist services	E. Gefen	Tel Aviv University	Reptilia and Taxidermist
Taxidermist services	Nature Campus	Tel Aviv University	Mammals, Birds and Taxidermist
Taxidermist services		Israel Nature and Parks Authority	Birds and Taxidermist
DNA Shipment	R. Barrientos	Spain	Birds
DNA Shipment	E. Shani	Society for the Protection of Nature in Israel	Birds
DNA Shipment	M. Dalebout	University of New South Wales, Australia	Mammals
Electronic Data	S. Ashkenazi	Hebrew University	All collections

Purpose	Name	Institute	Taxonomic group
Electronic Data	Nature Campus	Tel Aviv University	All collections
Electronic Data	O. Barnea	Israel Nature and Parks Authority	Invertebrates and Fish
Electronic Data	E. Renan	Ben-Gurion University of the Negev	Entomology
Electronic Data	L. Gahanma	Plant Protection and Inspection Services	Entomology
Data	A. Boldo	Israel Nature and Parks Authority	Mammals
Data	E. Hadad	Israel Nature and Parks Authority	Mammals
Shipment of Specimens	V. van Soest	Zoological Museum University of Amsterdam	Invertebrates: Sponges
Shipment of Specimens	C. Massin	Royal Belgian Institute of Natural Sciences Belgium	Invertebrates: Echinodermata
Shipment of Specimens	L. van Ofwegen	National Museum of Natural History , Leiden The Netherlands	Invertebrates: Soft Corals
Shipment of Specimens	M. Guillaume	Museum National d'Histoire Naturelle, Paris, France	Invertebrates: Soft Corals
Shipment of Specimens	I. Sella	University of Washington, USA	Invertebrates: Soft Corals
Shipment of Specimens	M.H. Schleyer	Oceanographic Research Institute uShaka Marine Park, South Africa	Invertebrates: Soft Corals
Shipment of Specimens	Y. Benayahu	National Museum of Natural History , Leiden The Netherlands	Invertebrates: Soft Corals
Shipment of Specimens	N. Teruaki	The Nagoya University Museum, Japan	Invertebrates: Tunicates
Shipment of Specimens	D.W. Wrase	Germany	Entomology

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	D. Michez	Laboratoire de Zoologie , Belgium	Entomology
Shipment of Specimens	D. Quicke	Division of Biology, Imperial College London, UK	Entomology
Shipment of Specimens	E. Scheuchl	Germany	Entomology
Shipment of Specimens	G. A. King	Department of Archaeology, University of York, UK	Entomology
Shipment of Specimens	G. Evans	Systematic Entomology Laboratory, Beltsville, USA	Entomology
Shipment of Specimens	G. Sabatinelli	Universita' la Sapienza, Italy	Entomology
Shipment of Specimens	H. Dathe	Entomologisches Institut, Germany	Entomology
Shipment of Specimens	H. Winkelmann	Germany	Entomology
Shipment of Specimens	H.-Y. Han	Department of Life Science, Yonsei University, Korea	Entomology
Shipment of Specimens	I. Grichanov	Institute of Plant Protection, Russia	Entomology
Shipment of Specimens	I. Winkler	North Carolina State University, USA	Entomology
Shipment of Specimens	J. Heraty	College of Natural and Agricultural Sciences, University of California	Entomology
Shipment of Specimens	J. Pelletier	France	Entomology
Shipment of Specimens	J. Roháček	Department of Entomology, Czech Republic	Entomology
Shipment of Specimens	M. Fibiger	Denmark	Entomology
Shipment of Specimens	J. Ziegler	Museum fuer Naturkunde, Berlin, Germany	Entomology

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	K. Szpila	Nicolaus Copernicus University, Poland	Entomology
Shipment of Specimens	L. Knutson	Department of Entomology, Smithsonian Institution, Washington	Entomology
Shipment of Specimens	L. Munari	Natural History Museum, Italy	Entomology
Shipment of Specimens	M. Barták	Czech University of Agriculture, Czech Republic	Entomology
Shipment of Specimens	M. De Meyer	Royal Museum for Central Africa, Belgium	Entomology
Shipment of Specimens	M. Fibiger	Denmark	Entomology
Shipment of Specimens	M. Gates	Smithsonian Institution, Washington DC	Entomology
Shipment of Specimens	M. Langer	Germany	Entomology
Shipment of Specimens	M. Schwarz	Austria	Entomology
Shipment of Specimens	M. Terzo	U.M.H., Laboratoire de Zoologie, Belgique	Entomology
Shipment of Specimens	M. Volkovitch	ZIN, Russia	Entomology
Shipment of Specimens	O. Pekarsky	Hungary	Entomology
Shipment of Specimens	O. Lonsdale	Smithsonian Institution, National Museum of Natural History, Washington, D.C.	Entomology
Shipment of Specimens	P. Pedata	Istituto per la Protezione delle Piante, Italy	Entomology
Shipment of Specimens	R. Mc Donnell	National University of Ireland	Entomology
Shipment of Specimens	S. Risch	Germany	Entomology
Shipment of Specimens	P. Schwendinger	Muséum d'histoire naturelle, Switzerland	Entomology

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	R. Preiss	United Kingdom	Entomology
Shipment of Specimens	S. Sinev	Universitetskaya naberezhnaya 1, Russia	Entomology
Shipment of Specimens	R. Szadziwski	University of Gdańsk,, Poland	Entomology
Shipment of Specimens	S. D. Gaimari	Plant Pest Diagnostics Lab, California Department of Food and Agriculture	Entomology
Shipment of Specimens	T. Pape	Zoologisk Museum, Denmark	Entomology
Shipment of Specimens	S. Patiny	Entomologie fonctionnelle et évolutive, Belgium	Entomology
Shipment of Specimens	S. Schmidt	Zoologische Staatssammlung, Germany	Entomology
Shipment of Specimens	T. Dikow	Division of Invertebrate Zoology, American Museum of Natural History, New York	Entomology
Shipment of Specimens	T. Saigusa	PhD., Kyushu University, Japan	Entomology
Shipment of Specimens	V. Richter	ZIN, Russia	Entomology
Shipment of Specimens	T. Griswold	Utah State University , USA	Entomology
Shipment of Specimens	V. Michelsen	Zoologisk Museum, University of Copenhagen, Denmark	Entomology
Shipment of Specimens	W. Moore	Department of Entomology, California Academy of Sciences, San Francisco	Entomology
Shipment of Specimens	W. Speidel	Museum Witt, Germany	Entomology

Purpose	Name	Institute	Taxonomic group
Shipment of Specimens	W. N. Mathis	National Museum of Natural History, Smithsonian Institution Washington	Entomology
Shipment of Specimens	Y. Dorchin	Kefar haHoresh, Israel	Entomology
Shipment of Specimens	D. Golani	Hebrew University	Fishes
Shipment of Specimens	G. Hulata	The Agricultural Research Organization, Volcani Center	Fishes
Shipment of Specimens	W.D. Anderson	Grice Marine Biology Laboratory, South Carolina, USA	Fishes
Shipment of Specimens	C. Fruciano	Dipartimento di Biologia Animale, University of Catania, Italy	Fishes
Shipment of Specimens	A. Hay	The Curator of the fish collection, Australian Museums, Australia	Fishes
Shipment of Specimens	J. Freyof	Leibniz Institute of Freshwater Ecology and Inland Fisheries, Germany	Fishes
Shipment of Specimens	M.A. McGrouther	Australian Museum, Australia	Fishes

Publications

The national collections of natural history are an important research infrastructure, used by scientists within and without the university. Approximately a decade ago we compiled the list of publications based on our natural history collections, and arrived at over 1,200 publications produced by over 550 scientists. This list was incomplete, for technical reasons related to reconstructing this record, and since it did not include the sizable list of publications based upon the anthropological collections. Our current list of the 2007/2008 publications, alas, is also incomplete; it includes all publications of TAU members affiliated with the collections and under-represents publications of individuals from other institutions, since our follow up is far from complete.

Refereed articles

1. Aronov, A. and Goren, M. 2008. Ecology of the Mottled Grouper (*Mycteroperca Rubra*) in the Eastern Mediterranean. Electronic Journal of Ichthyology 2:1-13.
2. Asiiimwe, P, Ecaat, J.S., Guershon, M., Kyamanywa, S., Gerling, D. and Legg, J.P. 2007. Evaluation of *Serangium* n.sp. (Col., Coccinellidae), a predator of *Bemisia tabaci* (Hom., Aleyrodidae) on cassava. Journal of Applied Entomology 131(2): 76-80.
3. Assefa, Z., Lam, Y.M. and Mienis, H.K. 2008. Symbolic use of terrestrial gastropod opercula during the Middle Stone Age at Porc-Epic Cave, Ethiopia. Current Anthropology 49(4):746-756 and 5 pp. [online-only material].
4. Barneah, O., Brickner, I., Hooge, M., Weis, V.M. and Benayahu, Y. 2007. Three party symbiosis: acoelomorph worms, corals and unicellular algal symbionts in Eilat (Red Sea). Marine Biology 151:1215-1223.
5. Bar-Oz, G., and Dayan, T. 2008. On the use of the petrous bone for estimating cranial abundance in fossil assemblages. Journal of Archaeological Science 34(9):1356-1360.
6. Bar-Oz, G., Bouchnik, R., Weiss, E., Weissbrod, L., Bar-Yosef Mayer, D.E. and Reich, R. 2007. "Holy Garbage": A Quantitative Study of the City-Dump of Early Roman Jerusalem. Levant 39:1-12.
7. Bar-Yosef Mayer, D.E. 2008. *Dentalium* Shells Used by Hunter-Gatherers and Pastoralists in the Levant. Archaeofauna 17:103-110.

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14. Bruyne, R.H. de and Mienis, H.K. 2008. Buren: geheim op oude muren. Voelspriet, 7(1):4.
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17. Elkrwe, H. M., Elhawaj, H. M., Galil, B. S. and Ben Abdallah A. 2008. The first record of *Percnon gibbesi* (Crustacea: Decapoda: Plagusiididae) from the southern rim of the Mediterranean. Aquatic Invasions 3(2):235-237.
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19. Friedman, A.L.L. and Freidberg, A. 2007. The Apionidae of Israel and the Sinai Peninsula (Coleoptera: Curculionoidea). Israel Journal of Entomology 37:55-180.
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29. Hansson, H.G. and Mienis, H.K. 2008. Libbie Henrietta Hyman. In H.G. Hansson (Ed.): Biographical Etymology of Marine Organism Names (BEMON) 1 p.
30. Hansson, H.G. and Mienis, H.K. 2008. Professor Dr. Hendrik Engel. In H.G. Hansson (Ed.): Biographical Etymology of Marine Organism Names (BEMON) 1 p.
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- 2006 Comparative skeletal features between Homo Floresiensis and patients with Laron Syndrome. XVI Paleopathology Association European Meeting, Santorini, Greece (Hershkovitz, I., Kornreich, L. and Laron, Z.).
- 2007 35th Annual Meeting of the Israel Society for Ecology & Environmental Quality Sciences (ISEEQS), Weizman Institute, Rehovot, Israel (Y.Gavrieli).
- 2007 44th meeting of the Zoological Society of Israel, Achva College, Israel (Y.Gavrieli).
- 2007 A novel efficient but inexpensive CO₂ generator based on nano-technology. 73th Annual Meeting of the AMCA (The American Mosquito Control Association) in Orland, USA (V. Kravchenko).
- 2007 ASOR meeting, San Diego, California. Paper presented: Early Neolithic Stone Beads of Gilgal (Bar-Yosef Mayer, D.E.).
- 2007 Back injuries in young dancers. 6th Interdisciplinary World Congress on Low Back & Pelvic Pain. Barcelona. (Steinberg, N., Siev-Ner, I., Peleg, S., Dar, G., Masharawi, Y., Alperovitch-Najenson, D. and Hershkovitz, I.).
- 2007 Back injuries in young dancers. Seventh Annual Meeting of the Israeli Physiotherapist Society (IPTS), Israel. (Steinberg, N., Siev-Ner, I., Peleg, S., Dar, G., Masharawi, Y., Ezra, D., Alperovitch-Najenson, D. and Hershkovitz, I.).
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- 2007 Osteological changes with age in the Cervical Spine. Seventh Annual Meeting of the Israeli Physiotherapist Society (IPTS), Israel. (Ezra, D., Masharawi, Y., Peleg, S., Darm G., Steinbergm N. and Hershkovitz, I.).
- 2007 Radiographic identification of sacroiliac joint bridging: Reliability and validity. Fourth Faculty Research Fair, Faculty of Social Welfare & Health Studies, Haifa University. (Dar, G., Peleg, S., Masharawi, Y., Steinberg, N., Rothschild, B.M. and Hershkovitz, I.).
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- 2007 Sacral anatomical orientation: Its association with spinal deformities and spondylolysis. 6th Interdisciplinary World Congress on Low Back & Pelvic Pain. Barcelona. (Peleg, S., Peled, N., Dar, G., Steinberg, N., Masharawi, Y., Alperovitch-Najenson, D., Medlej, B., Arensburg, B. and Hershkovitz, I.).
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- 2008 Multiple Enthesopathies in the human skeleton: what do they tell us about spinal diseases? 17th European Meeting of the Paleopathological Association "Diseases of the Past". Copenhagen, Denmark (Dar, G., Peleg, S., Masharawi, Y., Steinberg, N., May, H. and Hershkovitz, I.).
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- 2008 36th Annual Meeting of the Israel Society for Ecology & Environmental Quality Sciences (ISEEQS), Technion, Haifa, Israel (Y.Gavrieli).
- 2008 45th meeting of the Zoological Society of Israel, Open University, Israel (Y.Gavrieli).
- 2008 93rd Annual meeting of the Ecological Society of America: Enhancing Ecological Thought by Linking Research and Education, Milwaukee, WI, USA (Y.Gavrieli).
- 2008 ICAZ (International Council for Archaeo-Zoology) Archaeomalacology Work Group, Santander, Spain. Paper presented: Shells and Ochre in Middle Paleolithic Qafzeh Cave, Israel: Indications for Modern Behavior (Bar-Yosef Mayer, D.E.).
- 2008 Lesions in the femoral head and neck and their possible association with low back pain. The 9th Annual Israel Spine Society Meeting, Eilat (Medlej, B., Greenwald, C., Dar, G., Peleg, S., Steinberg, N., Masharawi, Y. and Hershkovitz, I.).
- 2008 Noctuidae (Lepidoptera) of Mt. Hermon. 7 The 26th Meeting of the Entomological Society of Israel. Hebrew University, Rehovot, Faculty of Agriculture (V. Kravchenko, Chikatunov V. and Pavlíček T.).

- 2008 Society for American Archaeology, Vancouver, Canada. Paper presented: Natufian Symbolism and Plant Domestication: A View from Stone Beads (Bar-Yosef Mayer, D.E.).
- 2008 Spinal injuries and low back pain in young dancers. The 9th Annual Israel Spine Society Meeting, Eilat (Steinberg, N., Siev Ner, I., Peleg, S., Dar, G., Masharawi, Y., Medlej, B. and Hershkovitz, I.).
- 2008 Sustaining Cultural and Biological Diversity in a Rapidly Changing World: Lessons for Global Policy, American Museum of natural history, New York City, NY, USA (Y.Gavrieli).
- 2008 Symposium on Creating Exhibitions. Organized by the MidAtlantic Association of Museums at the Franklin Institute and the University of Pennsylvania Museum, Philadelphia, PA, USA (Y.Gavrieli).
- 2008 Workshop: Shell Energy: Prehistoric Coastal Resource Strategies in Dakar, Senegal. Paper presented: Late Stone Age Shell Middens on the Red Sea Coast of Eritrea (Bar-Yosef Mayer, D.E.).

Public programs - Nature Campus

Nature Campus continued in its activities to advance communication of science about the natural history and living environment of Israel to children, teachers, nature guides, and the general public. In some programs, natural history collections play a key role, while in other programs artifacts such as skulls, bones, nests, eggs, live insects and stuffed animals are integrated into the learning experience.

Programs based on the natural history collections:

Public programs:

- **Guided Tours.** The program offers a two hour activity at the I. Meier Segals Garden for Zoological Research or the Botanic Gardens. During 2007/2008, the Gardens played host to 4,100 visitors comprised of groups of schoolchildren ages 6-18, teachers, nature guides, students from other institutions of higher education, and other organized groups.
- **Science Days.** The program offers a three to four-hour activity for classes at the Natural History Collections (the "Museum Class") as well as at the Gardens. Most of the activity at the collections is based on the collection's artifacts. The themes that are covered are diverse and include, among others, Marine Biology, Nature Conservation, Biodiversity, Reproduction in Nature, Plants and Their Environment, Predators and Prey, Evolution of Man, Adaptation, and Ecology of Temporary Winter Pools. The number of participants in these programs was 1,800 children.
- **Science Camps.** Science camps were being held during the Hannukah, Passover and summer school vacations. The camp, a 5 days program, offers a scientific exploration of the biosphere for primary school children. Each day is focused on a major phenomenon or process in the living world, for example the food web, behavior and communication, and adaptation. This year we were not allowed to market the program to TAU staff by TAU e-

mail network, our main audience and avenue of marketing. Therefore, only 126 children participated

- Professional Development and Training Days. Diverse training programs offer conservation biology enrichment for teachers and environmental organizations staff. The professional training program is tailored according to the participants' requirements. This year 35 professionals, including teachers, participated in our in-service training programs.

Overall, participation in Nature Campus programs declined compared to 2006/2007 due to two events: 1) A long teachers strike. 2) The end of a four year project – Urban Nature, which operated in Yaffo elementary schools.

On-Line resources

- Since the Collections capacity for public visitation is much limited, we put special effort in developing Nature Campus website – www.campusteva.tau.ac.il – which outreaches to the public, and offers, in a language understandable to all, the wealth of scientific research based on the Natural History Collections (Learning resources section).
- Zoo On-Line is a joint project with TAU I. Meier Segals Garden for Zoological Research. 6-8 cameras are continuously broadcasting from the Zoo. The pictures are accompanied with information, updated by Nature Campus webmaster, on the Zoo inhabitants. The project is supported by Israel Electric Company and Moked Amon Security Company.

Earthweb: our changing world. An online primer. During 2007 we have launched a new website – www.earthweb.tau.ac.il . The website – an online primer, offers information in Hebrew about the Earth systems, ecosystem services and highlight from status reports worldwide. The website was developed with the kind support of the Ministry of Environmental Protection and the Charles and Lynn Schusterman Family Foundation.

Collections budget

הוצאות שכר

סך העלות	מספר משרות	
4,199,806	15.3	סה"כ אוצרים
1,917,438	3.5	אוצרים (1)
882,782	2	אוצרים - עמיתי מחקר
0	4	אוצרים בגמלאות
1,043,901	5	מדענים עולים
355,685	0.8	אוצרים נלווים (2)
0		אחר
2,640,198	13.2	סגל טכני (4)
6,840,004	28.5	סה"כ הוצאות שכר

מלגות

120,750	מלגות פוסט דוק
120,750	סה"כ מלגות

הוצאות שאינן שכר

43,569	הוצאות אחסון
35,738	הוצאות שימור
51,600	הוצאות תיעוד וקטלוג
194,629	הוצאות לשיפור מצב האוספים (3)
325,535	סה"כ הוצאות שאינן שכר

7,286,289	סה"כ הוצאות לפני הוצאות מנהל ומשק
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1,457,258	הוצאות מנהל ומשק (20%)
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8,743,547	סה"כ הוצאות
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מקורות מימון

2,228,607	השתתפות ות"ת:
888,807	השתתפות ות"ת - קמ"ע
709,000	השתתפות ות"ת
630,800	תוספת השתתפות ות"ת לתמיכה בשדרוג האוספים (אישור ממאי 2008)
5,497,067	השתתפות מוסד:
1,889,539	השתתפות המוסד בהוצאות שכר האוצרים
1,703,985	השתתפות המוסד בהוצאות שכר הסגל הטכני
446,285	השתתפות המוסד בהוצאות שאינן שכר
1,457,258	השתתפות המוסד - הוצאות כלליות
1,017,873	הכנסות מגופים ציבוריים:
936,213	מענקי מחקר
81,660	משרד הקליטה
8,743,547	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 הנילוויים 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.

דו"ח הוצאות למרכז ידע תשתיתי – שנת תשס"ח

298,791	הוצאות משכורת
15,000	רכישת ציוד מדעי
10,889	רכישת חומרים
27,179	רכישות אחרות
115,228	הקצאת מלגות
54,406	הוצאות מינהל ומשק-תקורה
521,493	סה"כ

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

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Tamar Dayan	Department of Zoology	Director
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Yehuda Benayahu	Department of Zoology	Invertebrates
Amnon Freidberg	Department of Zoology	Entomology
Menachem Goren	Department of Zoology	Fishes
Lev Fishelson (emeritus)	Department of Zoology	Fishes
Dorothee Huchon	Department of Zoology	Molecular Systematics
Baruch Arensburg (emeritus)	Department of Anatomy & Anthropology	Physical Anthropology
Yoel Rak	Department of Anatomy & Anthropology	Physical Anthropology
Israel Hershkovitz	Department of Anatomy & Anthropology	Physical Anthropology
Nissan Binyamini (emeritus)	Department of Plant Sciences	Fungi
Margalith Galun (emeritus)	Department of Plant Sciences	Lichens
Jacob Garty (emeritus)	Department of Plant Sciences	Lichens
Ya'akov Lipkin (emeritus)	Department of Plant Sciences	Algae

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Silvia Blumenfeld	Department of Plant Sciences	Fungi
Vladimir Chikatunov	Department of Zoology	Coleoptera
Vassily Kravchenko	Department of Zoology	Lepidoptera
Sergei Zonstein	Department of Zoology	Arachnidae
Andy Lehrer (retired)	Department of Zoology	Diptera
Yuri Katz (retired)	Department of Zoology	Paleontology
Olga Orlov-Labkovsky	Department of Zoology	Micropaleontology

Associate curators (faculty members)

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Micha Ilan	Department of Zoology	Sponges
Dan Gerling (emeritus)	Department of Zoology	Hymenoptera
Abraham Hefetz	Department of Zoology	Entomology
Bella S. Galil	Israel Oceanographic & Limnological Research - Haifa	Crustaceans
Danny Simon	Department of Zoology	Formicidae
Ilan Yarom	Hazeva Research & Development	Diptera
Eli Geffen	Department of Zoology	Molecular Systematics
Ofer Mokady	Department of Zoology	Molecular Systematics
Elazar Kochva (emeritus)	Department of Zoology	Herpetology

VATAT supported expert collections managers

Armin Ionescu-Hirsch, PhD	Department of Zoology	Hymenoptera
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Moshe Guershon, PhD	Department of Zoology	Apoidea
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