

GUIDE OF HELMINTHOLOGICAL COLLECTIONS OF LATIN AMERICA

COMPILED BY



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PROLOGUE

The study of the helminth parasites of wild vertebrates in Latin America has a great tradition; the contribution of researchers as Travassos, Adolpho Lutz, and Teixeira de Freitas in Brazil, Szidat and Ostrowski de Núñez in Argentina, Caballero and Bravo-Hollis in Mexico, Brenes in Costa Rica, Ibáñez and Tantalean in Peru, Pérez-Vigueras in Cuba, and Mañé-Garzón in Uruguay, among others, has been transcendental to the understanding of the biodiversity of this group of parasites. The first reference of a scientific collection in this part of the American Continent dates from the early XX Century in Brazil; in this country, the Helminthological Collection of the Oswaldo Cruz Institute was founded in 1913. Since then, many other helminthological collections from several countries of this region were established; however, its development has been uneven and some of them have disappeared.

The existence of this type of collections in one of the most rich and diverse region of the world is essential. The information provided by them is invaluable, and their protection is responsibility of the institutions and governments of their countries of origin. However, the deposition of helminth specimens from Latin America in foreign collections is a common practice, not considering the local or even national collections. The main reason of this situation is probably the lack of knowledge about its existence or doubts about security conditions of the material.

As result of the meeting: “Colecciones Helmintológicas de América Latina: estado actual y perspectivas” conducted in March, 26, 2009 in La Plata City, Argentina, representatives of collections from Argentina and Mexico, proposed the co-edition of a document to compile information related to helminth collections in Latin America. In order to complete this goal, 13 institutions from 9 countries were invited; the great majority of them positively responded, which currently conform this Guide.

This first attempt of collective work has as main objective to disseminate among the international scientific community, the development and conditions of the collections in this area, establishing them as real receptors of specimens from these and other regions.

THE EDITORS



COLECCIÓN HELMINTOLÓGICA DEL MUSEO DE LA PLATA (MLP)

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La Plata (UNLP)*

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de La Plata.*

HISTORY

The “Colección Helmintológica” of Museo de La Plata is one of the 8 collections housed in the División Zoología Invertebrados (DZI). It is the largest helminthological collection in Argentina.

Dra. Carola Sutton founded the collection based on her research studies with endoparasitic fauna from rodents in 1970. In 1981, **Dra. Lía Lunaschi** began her research work with trematode parasites of fishes. Until then, the collection, included in the Invertebrate Zoology Collections, had no status as helminthological collection.

In 1990, the reorganization and restructuring process of the Museo de La Plata, gave it a formal “Collection” status and the Section Helminthology in the DZI was created due to the relevance of the research group and the Helminthological Collection. Thus, the current collection is based on the first research work of Carola Sutton and Lía Lunaschi.

Since then, the Collection is increased by the material collected for the researchers of the DZI and by contributions of researchers from other Institutions.

STAFF

CURATOR

Dra. Lía I. Lunaschi

Systematic and taxonomy of helminths, particularly trematodes Digenea from wild vertebrates.

ASSOCIATE RESEARCHERS

Dr. Francisco Brusa

Systematic and taxonomy of Turbellaria

Dra. Celina Digiani

Systematic and taxonomy of helminths, particularly Nematoda from rodents

Dra. Fabiana Drago

Systematic and taxonomy of endoparasites from wild birds

Lic. Matias Lamas – Fellowship on endoparasites

Systematic and ecology of helminths of saurian

Lic. Lisandro Negrette

Taxonomy of Tricladida Terricola (Turbellaria)

COLLECTION MANAGERS

Dra. Cristina Damborenea

Systematic and taxonomy of Turbellaria

TECHNICAL ASSISTANT

Lic. Victor Hugo Merlo Álvarez

Management and preservation of collection specimens

THE COLLECTION IN NUMBERS

- *NUMBER OF LOTS:* 4,114.
- *NUMBER OF SPECIMENS:* not determined
- *REPRESENTED GROUP OF HELMINTHS:* Platyhelminthes (Turbellaria, Aspidogastrea, Digenea, Monogenea, Cestoidea); Acanthocephala; Nematoda; Nematomorpha.
- *NUMBER OF SPECIES:* TOTAL: 443 species/168 holotypes; Turbellaria: 175 lots, 170 identified species/12; Aspidogastrea: 35 lots, 1 identified species/0; Digenea: 1012 lots, 153 identified species/38; Monogenea: 29 lots, 17 identified

species/12; Cestoidea: 269 lots, 74 identified species/8; Acanthocephala: 122 lots, 7 identified species/2; Nematoda: 1422 lots, 144 identified species/62; Nematomorpha: 286 lots, 56 identified species/ 35.

- *NUMBER OF TYPES*: Holotypes/paratypes/syntype/alotype: TOTAL: 168 holotypes/206 paratypes/27 syntype/43 alotype; by group of helminth: Turbellaria 12/24/1/0; Aspidogastrea 0/0/0/0; Digenea 38/62/9/0; Monogenea 11/12/0/0; Cestoidea 8/7/0/0; Acanthocephala 2/6/1/1; Nematoda 62/80/14/42; Nematomorpha 35/15/2/0.
- *REPRESENTED GROUP OF HOSTS*

Insecta (Coleoptera, Dictyoptera, Hemiptera, Hymenoptera, Orthoptera); **Mollusca** (Gastropoda, Bivalvia); Crustacea (Isopoda, Decapoda); **Pisces** (Characiformes, Perciformes, Pleuronectiformes, Clupeiformes, Atheriniformes, Chimaeriformes, Carcharhiniformes, Lamniformes, Cyprinodontiformes, Cypriniformes, Anguilliformes, Scorpaeniformes, Siluriformes, Osmeriformes, Carchariniformes, Salmoniformes, Gymnotiformes, Lepidosireniformes, Gadyiformes, Mugiliformes, Myliobatiformes, Rajiformes, Squaliformes, Gasterosteiformes); **Amphibia**; **Reptilia** (Squamata, Testudines, Crocodilia); **Aves**; **Mammalia** (Artiodactyla, Carnivora, Cetacea, Chiroptera, Didelphimorphia, Primates, Rodentia).

TABLE I.- REPRESENTED GROUP OF HOSTS

HOST GROUP	TURBELLARIA	ASPIDOGASTREA	DIGENEA	MONOGENEA	CESTOIDEA	ACANTHOCEPHALA	NEMATODA
INVERTEBRATES	14	0	7	0	0	0	18
FISHES	0	1	52	17	7	5	25
AMPHIBIANS	0	0	5	0	0	0	1
REPTILES	1	0	18	0	0	0	1
BIRDS	0	0	57	0	2	2	25
MAMMALS	0	0	26	0	7	2	78

ANNUAL INCREASE

During 2008, 159 lots were incorporated to the collection.

GEOGRAPHIC SCOPE (NATIONAL)

Specimens have been collected in Buenos Aires, Catamarca, Chaco, Chubut, Córdoba, Corrientes, Entre Ríos, Formosa, Islas Malvinas, Jujuy, La Pampa, Mendoza, Misiones, Neuquén, Rio Negro, Salta, San Juan, San Luis, Santa Cruz, Santa Fe, Santiago del Estero, and Tucumán.

Others: Mar Argentino.

GEOGRAPHIC SCOPE (INTERNATIONAL)

Regardless the Argentinean lots, there are fourteen lots from Bolivia, Brazil, Chile, Costa Rica, Scotland, Ecuador, Spain, France, Mexico, New Zealand, Peru, Uruguay, USA, and Vietnam.

PRESERVATION OF MATERIAL

The Collection consists predominantly of wet (in alcohol) and permanent slide specimens. There are a small number of scanning electron microscope preparations.

The wet collection is stored in a separate room and arranged by catalogue number. Slides (*in toto* specimens and histological sections), stained with different colourings and mounted with Canadian Balsam are arranged in cases by Class, Family and Genus.

DATA BASE

- Software: Microsoft Access 2003. In the future it will be migrated to an Institutional Soft which will shelter all of the Museo de La Plata collections.
- Number and categories of fields: 36 fields, 4 categories:
- Bibliographic: 1 field.
- Curatorial: 8 fields.
- Geographic: 5 fields.
- Specimen: 22 fields.
- Number of entries: 4,114.
- Web site: <http://www.fcnym.unlp.edu.ar/>

BIBLIOGRAPHY ASSOCIATED TO THE COLLECTION

The collection has a partial catalogue published in 2000. It includes only the specimens mounted in slides identified up to that moment. A catalogue of type material is in preparation.

Sutton, C.A. & M.C. Damborenea. 2000. Colección Helmintológica del Museo de La Plata: I. Catálogo de preparaciones microscópicas, material tipo y no tipo. *Serie Técnica y Didáctica Museo de La Plata* **35**: 1-20.

Published data about collection specimens are available. These are about 253 publications. The collection also has a small library with literature on different parasitic groups and on host's taxonomy.

GENERAL INFRASTRUCTURE

The Colección Helmintológica is one of the 8 invertebrate (except insect) collections housed in the DZI of Museo de La Plata. The wet preserved specimens of the helminthological collection are in a special room, shared with other wet collections of the DZI. The storage facilities are equipped with compact storage systems that greatly increase the amount of usable floor area. This area is prepared with the adequate security.

The slides are stored in special furniture, in plastic boxes.

The DZI also has an area for curatorial work with the informatics equipments, prints, etc. to carry out the everyday work.

PROCEDURES FOR INFORMATION, LOANS AND SERVICES

The Museo de La Plata has a collection management policy to regulate all the collections. The DZI has three documents to guide the way to send material and to ask for loans. The Curator can provide the documents.

Services: Specimens, including paratypes may be loaned for studies to researchers at recognized institutions. The loan period is usually six months. Inquiries concerning loans should be addressed to the collection curator. Holotype specimens may be loaned only in exceptional circumstances. The Curator reserves the right to determine whether or not a specimen is able to travel.

Laboratory facilities are available to visiting workers, but must be prearranged with the curator. A limited identification services is available, but prior arrangement is necessary.



COLECCIÓN NACIONAL DE PARASITOLOGÍA (MACN-PA)

Museo Argentino de Ciencias Naturales “Bernardino Rivadavia” (MACNBR)

ALEJANDRO TABLADO & FABIÁN TRICÁRICO

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Financial support: National state

HISTORY

Current National Collection of Parasitology is based on the material collected and studied by **Dr. Lothar Szidat**, since 1947 to 1973. This material, mainly helminth parasites, was donated by Dr. Szidat and deposited in the Invertebrates Division Collection of the Museo Argentino de Ciencias Naturales (MACN). After Dr. Szidat death, his disciple, **Dr. Margarita Ostrowski de Nuñez**, formalized the collection status, registering it in a Helminthological Catalogue of the Parasitology Laboratory in 1975. Dr. Ostrowski de Nuñez always has been related to the collection; however she is not a formal researcher at MACN, but in the Faculty of Exact and Natural Sciences of the University of Buenos Aires (FCEN-UBA).

Dr. Teodoro Stadler took charge of Parasitology Laboratory of the MACN and its collection at 90's. The curatorial tasks were entrusted to the **Lic. Fabián Tricárico**. Nevertheless, the Parasitology Laboratory currently did not have any specialists, but its administration and maintenance is ongoing thanks to the permanent collaboration of the Lic. Fabián Tricárico and by the support of Dr. Margarita Ostrowski de Nuñez and her research team of the UBA. In 2002, MACN officially recognized a total of 23 collections; now, the formerly “Helminthological Collection of Parasitology” was

designed as National Collection of Parasitology, identifying it with the acronym MACN-Pa. This collection depends organically of the Invertebrates Division and on its Curator, **Lic. Alejandro Tablado**.

STAFF

CURATOR

Lic. Alejandro Tablado.

Systematic of Asteroidea (Echinodermata) and ecology of benthic intertidal communities.

ASSOCIATE RESEARCHERS

Dr. Margarita Ostrowski de Nuñez

Biological cycles and systematic of freshwater Digenea, which involve fishes and birds as final hosts, and mollusks as intermediate hosts.

COLLECTION MANAGER

Lic. Fabián Tricárico

Scanning electronic microscope service.

THE COLLECTION IN NUMBERS

- *NUMBER OF LOTS:* 2,224.
- *NUMBER OF SPECIMENS:* 4,822.
- *REPRESENTED GROUP OF HELMINTHS:* Turbellaria, Digenea (Aspidogastrea, Digenea), Monogenea, Cestoidea (Cestodaria, Eucestoda), Acanthocephala, Nematoda (Ascaridida, Spirurida), Hirudinea. In addition, specimens of Mixozoa and Crustacea have been deposited.
- *NUMBER OF SPECIES:* TOTAL: 333 species; Turbellaria: 12; Digenea: 163; Aspidogastrea: 2; Monogenea: 19; Cestoidea: 70; Acanthocephala: 9; Nematoda: 28; Hirudinea: 1; other taxa: 28
- *NUMBER OF TYPES:* Holotypes/paratypes: TOTAL: 118/187; by group of helminth: Digenea: 30/56; Aspidogastrea 0/1; Monogenea 6/19;; Cestoidea 36/49; Acanthocephala 3/14; Nematoda 17/22; Hirudinea: 1/1; other taxa: 25/25.
- *REPRESENTED GROUP OF HOSTS*
Mollusca, other invertebrates (Chaetognatha, Crustacea and Insecta), Pisces (Chondrichthyes, Osteichthyes), Amphibia, Reptilia, Aves, and Mammalia. The hosts of 210 lots are unknown.

TABLE I.- REPRESENTED GROUP OF HOSTS

HOST GROUP								
	TURBELLARIA	ASPIDOGASTREA	DIGenea	MONOGENEA	CESTODEA	ACANTHOCEPHALA	NEMATODA	OTHER INVERTEBRATES
MOLLUSCS	28	0	81	1	4	0	0	0
INVERTEBRATES	3	0	5	0	1	0	2	7
FISHES	0	22	450	136	346	51	42	43
AMPHIBIANS	7	0	82	0	58	0	16	0
REPTILES	1	0	19	0	3	0	0	0
BIRDS	0	0	381	0	37	0	4	0
MAMMALS	4	0	92	0	63	0	25	0

ANNUAL INCREASE IN THE LAST DECADE

No data available.

GEOGRAPHIC SCOPE (NATIONAL)

Buenos Aires, Chaco, Chubut, Córdoba, Corrientes, Entre Ríos, Formosa, La Pampa, Neuquén, Río Negro, Salta, Santa Fe, Tierra del Fuego, Tucumán.

GEOGRAPHIC SCOPE (INTERNATIONAL)

Antarctica, South Orkney Islands, Chile, Brazil, Bulgaria, Uruguay, Gulf of Aqaba.

PRESERVATION OF MATERIAL

Mainly materials are in slides mounted with different media (Canada balsam, synthetic resin, etc), and a few lots with complete and bigger specimens are preserved in 70 % alcohol.

DATA BASE

- Software: Microsoft Access 97 + Aurora (application to viewing and entering data)
- Data base: A principal table and 6 tables related (taxonomy, collectors and determinators, geography, synonym, images, other data). All fields agree with Darwin-Core 2.0 standard.
- Specimen: 10 fields.
- Taxonomy: 12 fields

- etermination: 4 fields
- Bibliographic: 2 fields.
- Curatorial: 14 fields.
- Geographic: 17 fields.
- Collection: 9 fields
- Number of entries: 2,224
- Web site: under construction through Global Biodiversity Information Facility portal (GBIF).

BIBLIOGRAPHY ASSOCIATED TO THE COLLECTION

There is not a formal publication about this collection, i.e., list of type specimens. However, the material studied by Dr. Lothar Szidat and Dr. Margarita Ostrowski de Núñez has been published in several scientific papers.

GENERAL INFRASTRUCTURE

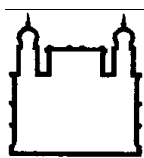
The whole collection is housed in one locker of glass and metal.

PROCEDURES FOR INFORMATION, LOANS AND SERVICES

The National Collection of Parasitology can be visited and consulted in the Museum all the working days, from 10:00 to 16:00 hs, but previous appointment with the curator is needed.

Loan of the material is possible, and it must be requested to the curator by note (an e-mail is enough) detailing the needed material, the need of the lending and the methods of study that will be applied on them. International loans of biological material required previous authorization of the National Office of Natural Resources.

Digital images of the material also can be solicited.



Ministério da Saúde
FIOCRUZ
Instituto Oswaldo Cruz
Laboratório de Helminthos Parasitos de Vertebrados
Coleção Helmintológica do Instituto Oswaldo Cruz



COLEÇÃO HELMINTOLÓGICA DO INSTITUTO OSWALDO CRUZ (CHIOC)

Laboratory of Helminth Parasites of Vertebrates (LHPV), Oswaldo Cruz Institute (IOC)

**MARCELO KNOFF, DELY NORONHA; ROBERTO MAGALHÃES PINTO, MAGDA
SANCHES, LIEGE RENATA SIQUEIRA, FABRÍCIO BRAUNS MATTOS & DELIR CORRÊA
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Financial support: FIOCRUZ

HISTORY

The history of the Helminthological Collection of the Oswaldo Cruz Institute (CHIOC) is mixed with that of the Laboratory Parasite of Vertebrates of the Oswaldo Cruz Institute. It derived from material collected during field works developed by **Gomes de Faria** and his apprentice **Lauro Pereira Travassos**, together with the deposits made by researchers at those early times, such as **Adolpho Lutz**, **Oswaldo Cruz**, **Gaspar Viana**, among others, at the beginning of the XX century. The survey kept on increasing by means of the incorporation of either private or institutional collections by the end of the XIX century onward. The CHIOC contains helminths of the Brazilian fauna representing a great biodiversity and recovered from a wide range of hosts captured in different biomes that include the Amazon, the Atlantic forest, the “Cerrado”, the Caatinga, the Swamplands, the Pampas, the Urban and the Continental and Marine Waters. Due to the donations of foreign specimens, there are helminths from the five continents. The amount of the survey has been often increased, taking into account the great number of deposits made either by Brazilian or foreign researchers. To

date, the collection preserves about 37,000 numerical lots that can vary from one to hundreds of specimens/lots. The first scientific data on the CHIOC as a collection were referred in 1913 and one year later, a type species deposited in the Instituto Oswaldo Cruz was referred to define the nature of the deposit. Samples that are derived from other institutional or private collections and that were included in the CHIOC, maintain the original numbers, together with those of the new incorporation in accordance with what was adopted in 1917, in papers dealing with the collections of the Bacteriological Institute of São Paulo and the Paulista Museum. The private collection of Pedro Severiano de Magalhães, researcher from the Bahiana School of Medicine, an important center for the study of helminths during the XIX and beginning of XX centuries was allocated in the CHIOC. Other reports supplied data on the incorporation of the helminth survey from the Pasteur Institute of São Paulo, a notorious research institute in the early XX century. Thus, the first type-species from the above referred school to be numbered and referred in a scientific paper was the trematode *Nephrostomus limai* Travassos, 1922, deposited in the CHIOC under the number 3767. Nevertheless, the types of *Cruzia tentaculata* Travassos, 1917, and that were part of unidentified samples collected by Adolpho Lutz and donated for study by the Bacteriological Institute of São Paulo, were really the first to be incorporated under numeration. To previously catalogue the helminthological material collected during incursions to the Brazilian hinterlands, the number (s) of the helminth (s) was matched to the numeration that appeared at the top of the pages of the necropsy books maintained at the CHIOC. Thus, the samples are deposited in the collection on the basis of the necropsy number and further on the serial number corresponding to their definitive inclusion. In 1979, hundreds of type species of helminths deposited in the CHIOC were catalogued. The collection was referred in a guide to the parasitological collections of the world in 1982,

and in this same year the process to institutionalize the CHIOC was started to be finally established in 1993. In 2000, during the festivities to commemorate the centenary of the Oswaldo Cruz Institute, the CHIOC home page was made available to the public. Three years later, along 2003, a new electronic data basis was developed to facilitate the access to the helminthological collection. In 2005, the CHIOC was included in the Environment Information Reference Center (CRIA) in a survey of the Brazilian zoological collections, to be, immediately after, considered one of the trustee depositaries of the Brazilian genetic patrimony.

Until 2007, the survey was allocated in a 30 m² room, where the helminths, as wet material, were kept in glass flasks in wood closets drawers, whereas whole mounts were maintained in sliding horizontally disposed trays that made the work very hard to be accomplished. Thus, changes were necessary and now the survey is maintained in modern steel closets with smoothly sliding doors. The capacity for future deposits was enlarged to be available for the next hundred years. At the moment the data base of the collection is being updated to permit that all the scientific information could be properly accessed.

The former researcher responsible for the first deposits in the CHIOC was **Dr. José Gomes de Faria** (20/May/1887-09/Aug/1962). Medicine doctor. The initial amount of the Helminthological Collection of the Oswaldo Cruz Institute mostly derives from the necropsies performed by Faria.

In 1915, **Dr. Lauro Pereira Travassos** (02/Jul/1890-20/Nov/1970) take the command of the Helminthology Laboratory and the curatorship of the helminth survey that was then forming a real collection. Medicine Doctor degree in the Faculdade de Medicina do Rio de Janeiro in 1913. In 1929 attending to an invitation of Fülleborn, stayed for 10 months in German, at the Hamburg Tropical Medicine Institute, where

acted as a lecturer. He was a member of the Sciences Brazilian Academy. He left an extensive list of followers most in helminthology: César Pinto, Jayme Lins de Almeida, Manoel Proença, Hugo de Souza Lopes, Herman Lent, João Ferreira Teixeira de Freitas, Domingos Arthur Machado Filho, Sebastião de Oliveira, Zeferino Vaz, Paulo Artigas, Clemente Pereira, Newton Santos, Henry Pearson, Romualdo Ferreira de Almeida, José Oiticica Filho, Alfredo Rey do Rego Barros, Rita Kloss, Dirce Lacombe, Jayade Mendonça, Amílcar Arandas Rego, Paulo Bührnheim, Henrique de Oliveira Rodrigues, Anna Kohn, Sylvio Celso Gonçalves da Costa, Sérgio Fragoso, Catarina da Silva Motta, Joaquim Júlio Vicente, Delir Corrêa Gomes and Dely Noronha. He published 436 scientific papers, of which 314 in helminthology and 122 in entomology. Skrjabin in the Sciences Academy of Moscow declared that Travassos was the greatest helminthologist in the world. Thus, the Brazilian school of helminthology is worldwide recognized. Travassos was the symbol of an era and died at the Hospital Evandro Chagas in the campus of the Oswaldo Cruz Institute.

In the 40's, Dr Travassos transferred the curatorship to **Dr. João Ferreira Teixeira de Freitas** (15/Mar/1912-10/Apr/1970). Medicine Doctor, was born in Rio de Janeiro; received his degree from the Faculdade de Medicina do Rio de Janeiro in 1934. Still as a student, completed the Instituto Oswaldo Cruz Application Course and was admitted in the institution in 1936. He was one of the most outstanding follower and co-author of Travassos in the helminthological research. He published several original papers and with Travassos was responsible for the Brazilian School of Helminthology. His classical work is the catalogue of the Brazilian digenetic trematodes, in collaboration with Lauro Travassos and Anna Kohn. He had an extensive teaching activity in several institutions of Brazil and also in Paraguay, where as the chief of a scientific mission, received the Merit Order from that country. In 1940 he became the first to maintain and enlarge the

helminthological collection. As a great leader, he worked with Cavalcante Proença, Herman Lent, Jayade Machado Mendonça, James Dobbin, Lins Almeida among others. He was a member of the Editorial Board of the former Revista Brasileira de Biologia (presently Brazilian Journal of Biology), from 1942 to 1957. Among his followers, we can distinguish Paulo Bührnheim, Anna Kohn, Henrique de Oliveira Rodrigues, Amilcar Arandas Rêgo, Catarina da Silva Motta, Delir Corrêa Gomes, Joaquim Júlio Vicente and Roberto Magalhães Pinto.

After the decease of Dr Teixeira de Freitas was the curator of the CHIOC from 1982 to 1989, **Dr. Delir Corrêa Gomes Maués da Serra Freire**. Biologist, graduated in Natural History by the former Universidade do Estado da Guanabara / UEG presently UERJ, is post-graduate as a Magister Scientie fellow in 1977 and Doctor in Sciences in the Veterinary Medicine/Veterinary Parasitology of the Universidade Federal Rural do Rio de Janeiro (UFRRJ). She was directly related to Dr. João Ferreira Teixeira de Freitas with whom she worked from 1963 to 1970. With 108 published original scientific papers. Besides these activities, also developed administrative functions in the institution of which was vice-director between 1993-1997. Conscious of the valuable institutional survey and its importance, introduced methodologies to preserve and increase the exchange of helminths with Brazilian and foreign researchers to later, indicate Dra. Dely Noronha, as her substitute. Group Leader, develops works together the staff of the Laboratory of Helminth Parasites of Vertebrates as well as with other outside groups from UERJ, UFRJ e UFF. Activities: Member of the Editorial Board of the Memórias do Instituto Oswaldo Cruz - 1986-1999. Coordinator of the Scientific Vocation Program of the Escola Politecnica de Saúde Joaquim Venâncio / Fiocruz - 1986-1997. Member of the IOC Post-Graduation Technical Chamber - 1998-2001. Member of the IOC Reference and Administration Centers Chamber. Orientation of

Master and Doctor fellows in the Post-Graduation Courses of Veterinary Medicine/UFRRJ and Parasitary Biology/IOC/Fiocruz.

Dr. Dely Noronha de Bragança Magalhães Pinto was the curator of the Helminthological Collection of the Oswaldo Cruz Institute from 1989 to Jul/2007. Biologist, graduated in Natural History from the former Faculdade Nacional de Filosofia of the Universidade Federal do Rio de Janeiro. From 1964 to 1969, she was as an apprentice, under the orientation of Lauro Travassos, published as his co-author 25 original papers and she was also under guidance of Teixeira de Freitas and Delir Corrêa Gomes, yet as a trainee. She was a CNPq research fellow from 1964-1984. In 2007, together with Dr Delir Corrêa Gomes Maués da Serra Freire obtained a Grant from the BNDES, that permitted the changes now applied to the CHIOC. Summarized developed activities: Head of the Laboratory of Helminth Parasites of Vertebrates/Department of Helminthology/IOC, from 1989 to 2007. Invited teacher of the Post-Graduation (Master Degree) Course in Human Parasitology of the Escola Nacional de Saúde Pública, Fiocruz (1976), and of the course Post-Graduation in Biological Sciences (Biophysics) of the Instituto de Biofísica Carlos Chagas Filho/UFRJ (1992-1993). Teacher (Topic of Helminthology) in the Technical Course in Parasitological Research/IOC from 1980 to 2005, in the Post-Graduation (Master & Doctor Degrees) Course of Tropical Medicine/IOC since 1991 to the present. Teacher in the Post-Graduation (Master Degree) Course of Parasitary Biology/IOC from 1991 to 2005. Orientation in the programs/projects: Scientific Vocation, PAP/IOC/Fiocruz, Tec-Tec I, II/Fiocruz/FAPERJ.

STAFF

CURATOR

Dr. Marcelo Knoff

Systematic and taxonomy of helminth parasites of Vertebrates, with special reference to trematodes, cestodes and nematodes parasites of fishes.

ASSOCIATE RESEARCHERS

Laboratory of Helminth Parasites of Vertebrates of the IOC

Dr. Delir Corrêa Gomes Maués da Serra Freire

Systematic and taxonomy of helminth parasites of Vertebrates, with special reference to trematodes, cestodes and nematodes.

Dr. Dely Noronha de Bragança Magalhães Pinto

Systematic and taxonomy of helminth parasites of Vertebrates, with special reference to acanthocephalan.

Dr. Luís Claudio Muniz Pereira

Systematic and taxonomy of helminth parasites of Vertebrates, with special reference to parasites of birds.

Dr. Roberto Regis Magalhães Pinto

Systematic and taxonomy of helminth parasites of Vertebrates, with special reference to trematodes, cestodes and nematodes.

Dr. Rosângela Rodrigues Silva.

Systematic and taxonomy of helminth parasites of Vertebrates, with special reference to trematodes, cestodes and nematodes parasites.

Laboratory of Helminth Parasites of Fishes of the IOC

Dr. Anna Khon Hoineff

Systematic and taxonomy of helminth parasites of Fishes, with special reference to trematodes and monogenea.

Dr. Berenice Maria Fernandes de Lima

Systematic and taxonomy of helminth parasites of Fishes, with special reference to trematodes.

Dr. Marcia Cristina Nascimento Justo

Systematic and taxonomy of helminth parasites of Fishes, with special reference to trematodes and monogenea.

Dr. Melissa Querido Cárdenas

Systematic and taxonomy of helminth parasites of Fishes, with special reference to trematodes and nematodes.

Dr. Simone Chincz Cohen.

Systematic and taxonomy of helminth parasites of Fishes, with special reference to trematodes and monogenea.

SCIENTIFIC ASSESSOR

Dr. Delir Corrêa Gomes.

Dr. Roberto Magalhães Pinto.

TECHNICAL ASSISTANT

Prof. Magda Sanches de Oliveira

Assistants for the receipt of deposits, loans, maintenance of the survey and updating the data base.

Prof. Liege Renata Siqueira

Assistants for the receipt of deposits, loans, maintenance of the survey and updating the data base.

Prof. Fabricio Brauns Mattos

Support and maintenance of the data base and the updating of the CHIOC site.

Mr. Elias do Nascimento

Responsible for the preparation of chemical solutions and materials routinely used during the maintenance and preservation of the samples.

THE COLLECTION IN NUMBERS

- *NUMBER OF LOTS:* 37,234 (extended into 49,241 samples of specimens preserved either as whole mounts or wet material).
- *NUMBER OF SPECIMENS:* 32,720 slides.
- *PARASITE GROUPS REPRESENTED (IN PERCENTAGES) ACCORDING TO THE NUMBER OF SAMPLES:* Nematoda (61.28), Digenea (23.72), Acanthocephala (3.97), Monogenea (3.57), Cestoidea (3.47), Aspidogastriada (0.90), Copepoda (0.87), Temnocephalida (0.83), Pentastomida (0.71), Nematomorpha and Hirudinea (0.68).
- *NUMBER OF SPECIES (TOTAL):* under analysis.
- *NUMBER OF SPECIES/GROUP:* under analysis.
- *NUMBER OF TYPES:* in a previous report (1979), there were 719 types: Nematoda of Vertebrates (345); Nematoda of Invertebrates (63); Platyhelminthes (Digenea and Monogenea [227]; Cestoidea [28]); Acanthocephala (52); Pentastomida (4), when paratypes were not considered. From 2002 to 2009, 81 holotypes and 440 paratypes have been deposited. The

complete list of types in the CHIOC is being surveyed and will be available soon.

- *REPRESENTED GROUP OF HOSTS*

Vertebrates: Pisces, Amphibia, Reptilia, Aves and Mammalia.

Invertebrates: Echinodermata, Ctenophora, Annelida, Mollusca and Arthropoda.

ANNUAL INCREASE IN THE LAST DECADE

From 1998 to 2008, 3,858 whole mounts and 1,058 wet material helminth samples were deposited in the CHIOC.

GEOGRAPHIC SCOPE (NATIONAL)

All biomes from all Brazilian regions. North: Acre, Amapá, Amazonas, Pará, Rondônia and Roraima; Northeast: Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco (including Fernando de Noronha), Piauí and Sergipe; Central-West: Goiás, Mato Grosso, Mato Grosso do Sul and Tocantins; Southeast: Espírito Santo, Minas Gerais, Rio de Janeiro and São Paulo; South: Paraná, Rio Grande do Sul and Santa Catarina.

GEOGRAPHIC SCOPE (INTERNATIONAL)

America, North America (Canada, Mexico and United States of America), Central America (Cuba and Guatemala), South America (Argentina, Brazil, Bolivia, Chile, Colombia, Ecuador, French Guiana, Peru, Paraguay, Uruguay and Venezuela), Europe (Belgium, England, France, Germany, Italy, Netherlands, Portugal, Romania, Russia, Switzerland and Czech Republic), Africa (Angola, Benin, Congo, Egypt, Gabon, Ivory Coast, Tanzania, Uganda, African North Coast and Cape North), Asia (China Republic [Taiwan], India, Israel, Japan and Vietnam) and Oceania (Australia and New Zealand).

PRESERVATION OF MATERIAL

The specimens are mounted in Canada balsam, Hoyer, etc. Many of the slides until the decade of '50 contain more than one specimen/slide, with up to 20

specimens/slide, with 2-4 different species in a same slide. Only from the 60's onward, the slides preserve 1 specimen each. Nevertheless, until today some deposits can be represented by more than one specimen/slide as in the case of the monogeneans. In some cases (adult cestodes) a same specimen can be preserved in separate slides; 16,458 glass flasks with specimens preserved as wet material (5-10% formalin, acetic formaldehyde, 5% glycerin + 70° alcohol, Bouin, etc). Most of the flasks contain more than one specimen and frequently in one single flask, a hundred individuals can be found; 63 plastic flasks with samples of specimens and helminth eggs preserved in 70% alcohol and maintained in a freezer (-30 °C). Many samples recovered previously were included needing to be identified so far.

DATA BASE

- Software: Microsoft SQL. (88 % of data have been processed).
- Number and categories of fields: 8 fields, 4 categories.
- Curatorial: 2 fields.
- Geographic: 6 fields.
- Specimen: 32 fields.
- Number of entries: 8.
- Web site: <http://helmintologia.ioc.fiocruz.br/>. Data are not still available for on line. Backup of data are preserved in HD and pen drives. The back up is updated monthly.

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GENERAL INFRASTRUCTURE

The CHIOC is physically as part of the Laboratory of Helminth Parasites of Vertebrates (LHPV), which is located on the 3rd. floor of the Pavillion Cardoso Fontes, with three rooms connected by internal doors. In the first room does the office, where is the curator, an informatics professional for entering the digital data of the new data and updating the records with the old data stored in files of paper, stored in a steel files, two

biologists stock to help carry out the procedures for requesting services such as deposits and loans from the collection, often there is the training of students in college in general biology, in the systematic of helminths and routines. In this room we have three computers and three printers and a multifunction able to make photocopies and a central table, with capacity for eight to ten people meet. In the second room with 30 m², where are sliding steel cabinets, which are stored specimens on slides (whole mounts) and in liquid medium (wet material), a table with four chairs and two stereomicroscopes, two light field microscopes and two closets (1,70 m x 1,00 m), which are used to manage the newly deposited material or the actual routine preservation and maintenance. In the third room, with 25 m², which is home to a small library and two computers, in one are stored all data on the deposits of helminths (database), the other to enter and store data on the bibliographies of library holdings and a laser printer for printing data on files of paper that are stored in the first room. Among other rooms of LHPV there's another room equipped with a laminar flow hood where the chemical vapors are carried, and part of the maintenance of the collection contained in liquid and slides, where the technician manufactures chemicals used. Another room is used to store flammable liquids in a chemical safety cabinet. One more room, with 5 m², which has a Leica stereomicroscope and a Zeiss Axiophot microscope both with a system image capture connected to a microcomputer.

PROCEDURES FOR INFORMATION, LOANS AND SERVICES

Deposits and loans of specimens; permitted visits for examination of samples *in loco*; loans of books and reprints that are included in the CHIOC facilities; mini-courses and lectures focusing the history of the CHIOC; professional capacitation courses.

Requests are to be made by researchers of public or private recognized institutions.

All service requests are to be addressed personally or by e-mail to the Curator by means of a fulfilled blank form (available at <http://helmintologia.ioc.fiocruz.br>).

Loans and deposits requests must be made in a formal requesting institutional letterhead sheet letter, signed by the responsible for the request (this letter can be a scanned PDF file to be sent attached to the e-mail).

Accepted deposits of samples must be received together with another letter with data on the material in accordance with the deposit form of the CHIOC. This form is also to be sent by e-mail. Deposits of new species only will be permitted in the case the paper in which specimens are included has been accepted for publication, what can be confirmed by means of an acceptance letter of the scientific periodical.

Visits, mini courses and lectures are to be booked in a minimum of 30 days prior to the event and will be accepted depending on the availability.



COLECCION DE TREMATODOS DE LA UNIVERSIDAD DE ANTIOQUIA (CTUA.116)

IMELDA VÉLEZ & CAROLINA LENIS

Laboratorio de Malacología Médica y Trematodos-LMMT. Programa de Estudio y Control de Enfermedades Tropicales-PECET. Sede de Investigación Universitaria-SIU. Calle 62 # 52-59 Torre 2, laboratorio 730. Medellín City, COLOMBIA. Telephone: 57(4)2196514; Fax: 57(4)2196511; e-mail: ivelez@matematicas.udea.edu.co ; caro_lenis16@yahoo.com

Financial support: Programa de Estudio y Control de Enfermedades Tropicales-PECET, Universidad de Antioquia.

HISTORY

In 1977, the biologist **Imelda Vélez** initiated a personal collection of trematodes based on studies carried out on the masked booby *Sula dactylatra* (Aves) and fishes (Lutjanidae) from Santa Marta and the surrounding area, under the supervision of **Dr. B. Werdning**. Between 1983 and 2003 this trematode collection was expanded to include material from bats collected in the Colombian departments of Antioquia and Valle del Cauca. During this period, five holotypes and several of their paratypes were deposited in the Manter Laboratory of Parasitology (HWML), University of Nebraska and U.S. National Parasite Collection (USNPC).

In 2000 the *Instituto de Investigación de Recursos Biológicos Alexander von Humboldt* (IAvH) established the National Registry of Collections, where Professor Vélez registered her private collection under the name: “Colección de Tremátodos de la Universidad de Antioquia”, using the acronym CTUA.116.

In 2004, this collection was deposited by Prof. Vélez in the *Laboratorio de Malacología Médica y Trematodos-PECET*, and together with the biologist **Carolina Lenis** began the process of systemization. In 2008, Lenis received training in curatorial activities by the personal of the Colección Nacional de Helminths (CNHE) of the *Instituto de Biología* of the *Universidad Autónoma de México*. This instruction allowed to established new parameters of curation and data processing currently employed by the CTUA.116.

The Trematode Collection of the University of Antioquia has received support from the *Instituto de Investigaciones Marinas y Costeras (INVEMAR)*; *Comité para el Desarrollo de la Investigación CODI*, and *Programa de Estudio y Control de Enfermedades Tropicales (PECET)*, University of Antioquia, and *Departamento Administrativo de Ciencia, Tecnología e Innovación (Colciencias)*.

STAFF

CURATOR

Ph.D. Imelda Vélez Biologist

ASSOCIATE RESEARCHER

M. Sc. Luz Elena Velásquez Marine biologists, Coordinator *Laboratorio de Malacología Médica y Trematodos-PECET*.

COLLECTION MANAGER

M. Sc. Carolina A. Lenis Biologist.

THE COLLECTION IN NUMBERS

- NUMBER OF LOTS: 135 of the classes Digenea and Monogenea.
- NUMBER OF SPECIMENS: 1005 catalogued in 31 families and 60 genera.
- REPRESENTED GROUP OF HELMINTHS: Digenea; Monogenea
- NUMBER OF SPECIES: TOTAL: 75 species /3 holotypes/ 8 paratypes/ 124 voucher specimens; Digenea: 74/75; Monogenea: 1/75.

- REPRESENTED GROUP OF HOSTS:

TABLE I.- REPRESENTED GROUP OF HOSTS

HOST GROUP	%	DIGENEA	MONOGENEA
GASTEROPODS	7.1	2	0
CRUSTACEANS	5.3	1	0
FISHES	1.8	27	0
AMPHIBIANS	10.7	2	0
REPTILES	46.4	11	1
BIRDS	1.78	7	0
MAMMALS	26.7	24	0

ANNUAL INCREASE IN THE LAST DECADE

Between 2001 and 2009 the CTUA.116 included 416 specimens in 56 lots; 16 families, 22 genera and about 26 species have been added in the last decade, representing a growth of nearly 42%. The average annual growth is 3 lots, except for the years 2005 and 2008, in which were deposited 14 and 18 lots respectively.

GEOGRAPHIC SCOPE (NATIONAL)

The CTUA.116 includes specimens from the Colombian departments of Antioquia, Bolívar, Chocó, Magdalena, Meta, Montería, Sucre and Valle del Cauca.

PRESERVATION OF MATERIAL

The specimens in CTUA.116 are preserved in permanent slides mounted in Canada balsam; slides are organized in boxes of wood following a progressive catalogue number.

DATA BASE

- Software: Microsoft Access 2007
- Number and categories of fields: 84 fields, 7 categories

- Collection: 28 fields.
- Catalogue: 34 fields.
- Bibliographic: 22 fields.
- Number of entries: 135 lots.
- Web site: www.pecet-colombia.org/mal.html

BIBLIOGRAPHY ASSOCIATED TO THE COLLECTION

The CTUA.116 possesses 22 publications related to the specimens deposited in the collection and a specialized consultation library, which belongs to the *Laboratorio de Malacología Médica y Tremátodos*-PECET. This latter possesses more than 700 publications and currently is under systemization.

GENERAL INFRASTRUCTURE

The collection is physically housed at *Laboratorio de Malacología Médica y Tremátodos* -PECET. The infrastructure of this laboratory allows dissection of hosts or host tissues, mounting of specimens, measurement and illustration of the helminths and data processing. In addition, PECET has a molecular biology research program and space in its Animal House for both conventional and SPF (Specific Pathogen-Free) animals, allowing the maintenance of larval stages or adults of helminth species to conduct studies related to life cycles or molecular genetics.

PROCEDURES FOR INFORMATION, LOANS AND SERVICES

Consultations

Permission to consult CTUA.116 involves contacting the curator responsible, with eight days of advance warning. The request should contain: *i*) a summary of the project, *ii*) type of service solicited, *iii*) institution making the request, *iv*) person carrying out the study and *v*) proposed date of visit.

Every specimen studied or used for scientific articles, undergraduate studies or theses, must be cited using the acronym CTUA.116, and institutional credit accorded to

the University of Antioquia. On finalizing the study a copy of the article, document, text or thesis should be donated to the CTUA.116 library.

Loans

The CTUA.116 specimens may only be loaned for research purposes in recognized institutions, by means of a loan agreement between the Universidad de Antioquia and the institution making the request (responsible for its care and return). The loan of type specimens is only available within Colombia and only considers to be justified when the original description of a species is thought to be incorrect. The material is lent for a period of 60 days, which may be extended if necessary, subject to request. The soliciting entity covers the cost of postage and return of the specimens.

Services

Deposition of specimens: Specimens to be deposited in CTUA.116 should contain the information included in the specimen deposit form. All specimens should be clearly labeled. Catalogue numbers are only assigned to specimens deposited in the collection.

Taxonomic identification: When the taxonomic identification service is solicited it is recommended that at least one specimen be deposited in the CTUA.116. The price of this service was set by the LMMT-PECET.



COLECCIÓN HELMINTOLÓGICA DE COSTA RICA (CHCR)

Facultad de Microbiología, Universidad de Costa Rica (UCR)

GABRIELA SOLANO TREJOS

Laboratorio de Helminología Médica, Facultad de Microbiología, Ciudad Universitaria, Universidad de Costa Rica, San José. COSTA RICA. P.O. Box 2060. Telephone: (506) 25 11 41 93; Fax: (506) 25 11 43 60; e-mail: maria.solanotrej@ucr.ac.cr
Financial support: Universidad de Costa Rica.

HISTORY

The Helminth Collection of Costa Rica (Colección de Helminthos de Costa Rica, CHCR) started more than 50 years ago in the Parasitology Department, School of Microbiology, University of Costa Rica. **Dr. Rodrigo Brenes-Madrigal** made the first checklist of parasites from both wild and domestic vertebrates as well as from human beings present in Costa Rica. This list published in 1961 included 150 species. His effort represented the first attempt to compile the information regarding Costa Rica's biodiversity of helminth parasites.

The collection of specimens housed in the School of Microbiology, reemerged by initiative of **Dr. Beatriz Rodríguez-Ortíz** as a result of a collaboration with researches from the Helminthology Laboratory of the Instituto de Biología, Universidad Autónoma de México in 2001. As a result of this effort a Checklist of the helminth parasites of vertebrates in Costa Rica was published in 2004. Parallel to this initiative, the University of Costa Rica supported the creation and maintenance of biological collections in its different schools that resulted in economic support and standardization of the data collection in the institution. Since then, the number of helminth parasites collected from Costa Rican hosts saved in this repository has increased and it is the

hope that this collection will become an important source of information for foreign and national parasitologists.

STAFF

CURATOR & COLLECTION MANAGER

Gabriela Solano Trejos, M. Sc.

Molecular diagnostic tests for parasitic nematodes

THE COLLECTION IN NUMBERS

- NUMBER OF LOTS: 256
- NUMBER OF SPECIMENS: 304.
- REPRESENTED GROUP OF HELMINTHS: Digenea, Monogenea, Cestoidea, and Nematoda.
- NUMBER OF SPECIES: TOTAL: 164; Digenea: 125; Monogenea: 7; Cestoidea: 1; Nematoda: 31.
- NUMBER OF TYPES: Holotypes/paratypes: TOTAL: 19/47; by group of helminth: Digenea 16/37; Monogenea 0/1; Nematoda 3/9.
- REPRESENTED GROUP OF HOSTS

TABLE I.- REPRESENTED GROUP OF HOSTS

HOST GROUP	DIGENEA	MONOGENEA	CESTOIDEA	NEMATODA
	FISHES	9	9	1
AMPHIBIANS	21	4	0	0
REPTILES	128	0	0	12
BIRDS	40	0	0	7
MAMMALS	24	0	0	41

ANNUAL INCREASE

In the last four years, the collection increased its number of Digenean specimens by 50% and there was a deposit of two different nematode species where 30 type specimens were stored in the collection including.

GEOGRAPHIC SCOPE (NATIONAL)

Specimens have been collected in seven Costa Rican provinces: San Jose, Heredia, Alajuela, Cartago, Puntarenas, Guanacaste, and Limon.

GEOGRAPHIC SCOPE (INTERNATIONAL)

The CHCR have helminth species from 4 different countries: Mexico, Panama, Brazil and Guatemala.

PRESERVATION OF MATERIAL

The majority of the helminthes in the collection are mounted permanently on slides using Canada balsam and more recently Cytoseal. The bottled specimens are preserved in screw cap bottles in a solution of 70% ethanol.

DATA BASE

- Software: File Maker Pro 6 Unlimited.
- Number and categories of fields: 56 fields. Categories:
- Identification: 8 fields.
- Parasite information: 16 fields.
- Host information: 10 fields.
- Miscellaneous information: 22 fields.
- Number of entries: 280.
- Web site: There is no website available at the moment.

BIBLIOGRAPHY ASSOCIATED TO THE COLLECTION

The Bibliography section keeps the information about Costa Rican Helminth species, including the ones that are not part of the CHCR. The Checklist database records all the information available about Costa Rican worms described up to date. Unfortunately this information is not available on line.

Special publications and list of specimens

Brenes-Madrigal, R. 1961. Catálogo de los Helmintos parásitos de Costa Rica.

Revista de Biología Tropical **9**: 67-95.

Rodríguez- Ortiz, B., L. García-Prieto & G. Pérez-Ponce de León. 2004. Checklist of Helminth **Parasites** of Vertebrates in Costa Rica. *Revista de Biología Tropical* **52**: 313-354.

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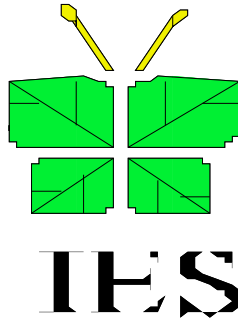
GENERAL INFRASTRUCTURE

The specimens of the collection are housed at the Helminthology Laboratory, School of Microbiology, University of Costa Rica. The glass slides are stored in wooden slide boxes and bottles are kept in larger boxes. The Helminthology Laboratory is equipped with two Olympus CX31 microscopes, one of which has an adaptable camera and three Olympus microscopes CH-BI45-2. There are also two dissecting scopes: a Nikon SMX 645 and a Leica Zoom 2000. Also, the laboratory has a small library containing more than 600 parasitology books and scientific journals. Among these books, classification keys to nematoda, Digenea and cestodea can be found. There are two refrigerators, one freezer and two centrifuges: Thermo Scientific Sorvall ST-16 and a Fischer Scientific 228.

PROCEDURES FOR INFORMATION, LOANS AND SERVICES

The specimens in the CHCR were deposited for permanent preservation. Type specimens are generally not available for loans but they can be accessed for consultation at the Helminthology Laboratory, School of Microbiology, University of Costa Rica. Specimens may be sent on loan by request of researchers affiliated to

different institutions. The requests should be addressed to the curator and should include the nature of the study. The time of the loan will be discussed when the request is made. The borrowing institution will be responsible for the material while in transit and at the time of the loan. In addition to this, the institution should assume the costs of the return shipment and the adequate packaging of the specimens for mailing. The packages should be strong enough to withstand transit using shockproof absorbent material.



COLECCIONES ZOOLOGICAS DEL INSTITUTO DE ECOLOGÍA Y SISTEMÁTICA- COLECCIÓN HELMINTOLÓGICA (CZACC)

Instituto de Ecología y Sistemática, La Habana (IES)

**JANS MORFFE RODRÍGUEZ, NAYLA GARCÍA RODRÍGUEZ, MARÍA LUISA VENTOSA
ZENA**

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8088; e-mail: jans@ecologia.cu, nayla@ecologia.cu, mluisa@ecologia.cu.

*Financial support: Agencia de Medio Ambiente (AMA), Ministerio de Ciencia, Tecnología y Medio
Ambiente (CITMA).*

HISTORY

The collection was created in 1965, on the basis of the Laboratorio de Parasitología from the Instituto de Biología, Academia de Ciencias de Cuba. It was lead initially by **Lic. Alberto Coy Otero**. The initial arrangement of collection was based on the main groups of endoparasites. The specimens deposited initially were the result of the first studies on parasites of Cuban vertebrates.

With the creation, in 1972, of the Instituto de Zoología, the collection was re-arranged in sections according with the groups of hosts. It was still lead by Alberto Coy.

In 1987 was created the Instituto de Ecología y Sistemática (IES), as a result of the coalition of the institutes of Zoology, Botany and Experimental Chemistry and the collection was moved to its actual location. In 1992 the IES was attached to Ministerio de Ciencia, Tecnología y Medio Ambiente (CITMA).

In 2000 was established the Curatorial Procedure for Cuban Zoological Collections (González *et al.*, 2008). This document standardizes the protocols of formation, increment, conservation and management of such collection. In 2002 was created the Departamento de Colecciones Zoológicas and the **MSc. Luisa Ventosa Zenea** was designated as curator of the Helminthological Collection.

Among people that contributed to formation and increment of this collection as collectors and/or parasitologists we can mention Dr. V. Barus, Dr. B. Rysavyi, Dr. Alberto Coy, Dr. J. Martínez, Dr. L. F. de Armas, Dr. A. Pérez, MSc. N. García, MSc. L. Ventosa and Lic. J. Morffe.

This collection specialized on parasitic helminths from wild fauna is unique in Cuba. 160 of the 621 species of Cuban helminths (25.7%) are represented in the collection. Also, 37 species from domestic animals are included.

STAFF

CURATOR

María Luisa Ventosa Zenea, M. Sc.

Parasitic nematodes (Thelastomatidae, Protrelloididae) of cockroaches.

ASSOCIATE RESEARCHERS

Lic. Jans Morffe Rodríguez

Parasitic nematodes of Coleoptera (Passalidae, Hydrophilidae and Scarabaeidae) and millipedes (Diplopoda)

COLLECTION MANAGER

MSc. Nayla García Rodríguez

Parasitic nematodes of millipedes (Diplopoda), Coleoptera and cockroaches.

THE COLLECTION IN NUMBERS

- NUMBER OF LOTS: 764 lots of parasites from vertebrates (parasites of invertebrates are in process of mounting).
- NUMBER OF SPECIMENS: 4512, 4353 specimens of parasites from vertebrates and 159 of parasites from invertebrates.

- REPRESENTED GROUP OF HELMINTHS: Digenea, Cestoidea and Nematoda.
- NUMBER OF SPECIES: TOTAL: 76; Digenea: 7; Cestoidea: 4; Nematoda: 65.
- NUMBER OF TYPES: Holotypes/paratypes: TOTAL: 48/211; by group of helminth: Digenea 3/3; Cestoidea 4/8; Nematoda 41/200.
- REPRESENTED GROUP OF HOSTS

TABLE I.- REPRESENTED GROUP OF HOSTS

HOST GROUP	DIGENEA		
	DIGENEA	CESTOIDEA	NEMAODA
ARTHROPODS	0	0	39
FISHES	2	0	1
AMPHIBIANS	1	0	2
REPTILES	3	0	13
BIRDS	0	4	2
MAMMALS	1	0	8

ANNUAL INCREASE

Pretty unstable due to the scarce of resources for collect, processing and conservation of material.

GEOGRAPHIC SCOPE (NATIONAL)

In the collection are deposited specimens from the 14 provinces of Cuba: Pinar del Río, Ciudad de La Habana, La Habana, Matanzas, Villa Clara, Cienfuegos, Sancti Spíritus, Ciego de Avila, Camagüey, Las Tunas, Holguín, Santiago de Cuba, Granma and Guantánamo. Is also included the Special Municipality Isla de la Juventud and several keys adjacent to Cuban shores.

GEOGRAPHIC SCOPE (INTERNATIONAL)

Four countries are represented in the collection: Mexico, Nicaragua, Dominican Republic and Puerto Rico. All of this material consists of nematodes from arthropods.

PRESERVATION OF MATERIAL

The most of specimens of collection (both Nematoda and Platyhelminthes) are preserved in 70% ethanol. Some species of Cestoidea, Digenea and Nematoda from vertebrates are mounted on slides in Canada balsam. Part of the collection of nematodes from arthropods (Diplopoda and Coleoptera) is mounted on slides in glycerine (edges of coverslips sealed with nail polish). Actually we are working in the mounting of the rest of this collection.

DATA BASE

Recently lost, due to problems with the PC. Actually in process of recovery.

BIBLIOGRAPHY ASSOCIATED TO THE COLLECTION

A catalogue of types (Ventosa *et al.*, 2002) was published, but there are not available on line. More than 30 papers on parasites of vertebrates and approximately 26 on parasites of invertebrates are published. The most of these papers are available in the collection or the library of the institution.

Special publications and list of specimens

González, H., G. Silva, N. García & A. Pérez. 2009. Procedimiento Curatorial para Colecciones Zoológicas Cubanas. *Acta Botánica Cubana* **Special number**: 1-41.

Ventosa, L., A. Coy & N. García. 2002. Tipos de helmintos (Nematoda, Cestoda, Trematoda) depositados en el Instituto de Ecología y Sistemática, Cuba. *Poeyana* **486**: 8-12.

GENERAL INFRASTRUCTURE

The Helminthological Collection is one of the eight collections that conform the Colecciones Zoológicas del Instituto de Ecología y Sistemática. Is located in a climatized room together with Arachnological and Acarological collections. The jars and slide boxes are stored in two cabined of metal and wood.

PROCEDURES FOR INFORMATION, LOANS AND SERVICES

We follow the procedures standardized in the Curatorial Procedure for Cuban Zoological Collections (González *et al.*, 2008). The collection is open to specialists, students and public in general. Borrows are authorized only to qualified personnel belonging to recognized institutions. As a rule, only paratypes and/or vouchers are borrowed for six months to one year.

ACKNOWLEDGEMENTS

To Dr. Alberto Coy Otero for his contribution to the parasitology of the Cuban wild fauna. To Dr. Nerly Lorenzo Hernández and Lic. Lorenza Basulto Chaple for their work in the preservation of the material deposited in the collection. To Dr. V. Barus, Dr. B. Rysavyi, Dr. J. Martínez, Dr. L. F. de Armas, Dr. A. Pérez and all the collectors that contributed to the increase of the collection.



COLECCIÓN HELMINTOLÓGICA DEL CINVESTAV (CHCM)

*Departamento de Recursos del Mar, Centro de Investigación y de Estudios Avanzados
del IPN Unidad Mérida*

**MA. LEOPOLDINA AGUIRRE-MACEDO, HUGO H. MEJÍA-MADRID & VICTOR M.-
VIDAL-MARTÍNEZ**

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Financial support: Centro de Investigación y de Estudios Avanzados del IPN

HISTORY

The Colección de Helmintos del CINVESTAV-IPN Unidad Mérida, housed by the Centro de Investigación y de Estudios Avanzados del IPN in its Merida campus was formally founded in 2000. In this year, it was organized and partially systematized as part of the CONABIO grant “Helmintos parásitos de peces del sureste de México” financed to **Victor M. Vidal-Martínez** and **Ma. Leopoldina Aguirre-Macedo**. Former researchers at CINVESTAV-IPN Parasitology Laboratory such as Guillermo Salgado-Maldonado (1985-1989), Tomas Scholz (1993-1994) and Frantisek Moravec (1994-1995) (this last 2 as visiting professors from the Institute of Parasitology of the Academy of Sciences of the Czech Republic) had preserved material of parasites found during their investigations in marine and freshwater fish from Yucatan Peninsula, the Caribbean and the gulf of Mexico. In 2000, the collection was formally recognized by CONABIO within the “Catálogo de Autoridades Taxonómicas” (<http://www.conabio.gob.mx>), and initially held 395 specimens from 131 hosts.

The collection was created with the aim of keeping reference materials of helminth and other parasites of vertebrate and invertebrate hosts from Southeastern Mexico, Central America and the Caribbean. The collection supports regional research on taxonomy, systematic biology, ecology, biodiversity and biogeography of parasitic helminths in the region. Since its inception in 2000 the collection has received 110 specimens mainly from research developed by the members of the laboratory, in collaboration with other research groups including those of Dr. David González-Solis (Colegio de la Frontera Sur), Dr. Sergio Guillén-Hernández (Universidad Autónoma de Yucatán) Dr. Juan Violante-González (Universidad Autónoma de Guerrero), M en C. Eduardo Siu (Bluefields Indian and Caribbean University of Nicaragua), Dr. Mark Torchin (Smithsonian Tropical Institute, Panama), Dr. Delane C. Kristsky (University of Idaho), Dr. Tomas Scholz and Dr. Frantisek Moravec (Institute of Parasitology of the Academy of Sciences of the Czech Republic). The collection is still incipient and in a stage of developmental process that will lead to the improvement of the organization and systematization of its data base.

STAFF

CURATOR

Dr. Victor M. Vidal Martínez

Taxonomy, systematics, and ecology of helminths of aquatic organisms.

ASSOCIATE RESEARCHERS

Dra. Ma. Leopoldina Aguirre-Macedo

Taxonomy, systematics and ecology of helminths, especially on trematodes and their vertebrate and invertebrate intermediate hosts.

Dr. Hugo H. Mejia-Madrid

Molecular systematics, phylogeny, and biogeography of helminths, with special reference to nematodes.

Dr. Edgar Mendoza-Franco

Phylogeny, systematics and biogeography of helminths, with special reference to monogeneans.

COLLECTION MANAGERS

Dra. Ma. Leopoldina Aguirre-Macedo
Dr. Hugo H. Mejía-Madrid

TECHNICAL ASSISTANT

Q.F.B. Clara M. Vivas-Rodríguez
Maintenance of the collection.

THE COLLECTION IN NUMBERS

- *NUMBER OF LOTS:* 7 (containin 83 specimens each).
- *NUMBER OF SPECIMENS:* 567.
- *REPRESENTED GROUPS OF HELMINTHS:* Aspidogastrea, Digenea, Monogenea, Cestoidea, Acanthocephala, Nematoda, and Hirudinea.
- *NUMBER OF SPECIES:* TOTAL: 175; Digenea: 101; Aspidogastrea: 4; Monogenea: 16; Cestoidea: 8; Acanthocephala: 7; Nematoda: 38; Hirudinea: 1.

NUMBER OF TYPES: Holotypes/paratypes: TOTAL: 0/4; by group of helminth: Digenea: 0/2; Monogenea: 0/2.

- REPRESENTED GROUP OF HOSTS (SPECIMENS)

TABLE I.- REPRESENTED GROUP OF HOSTS

HOST GROUP	ASPIDOGASTREA	DIGENEA	MONOGENEA	CESTOIDEA	ACANTHOCEPHAL	NEMATODA	HIRUDINEA
FISHES	6	305	46	10	17	185	2
REPTILES	0	1	0	0	0	0	0
BIRDS	0	3	0	0	0	1	0

ANNUAL INCREASE IN THE LAST DECADE

Despite its recent inception, the CHCM has nearly duplicated its number of specimens during its first decade from 395 to 567.

GEOGRAPHIC SCOPE (NATIONAL)

Specimens have been collected mainly in Southeastern Mexico covering the states of Veracruz (5 specimens), Tabasco (47), Chiapas (41), Campeche (53), Yucatán (158), Quintana Roo (211) and Guerrero with only one specimen.

GEOGRAPHIC SCOPE (INTERNATIONAL)

The collection has a total of 57 specimens from outside Mexico, 1 from Guatemala, 52 from Nicaragua and 4 from Cuba.

PRESERVATION OF MATERIAL

The specimens are preserved in 2 primary media: slides, which are mounted in Canada balsam or synthetic resin; and the wet collection containing vials with preserving liquid: 96% OH (67%), formaldehyde (7.2%), and distilled water (20.8%).

DATA BASE

- Software: Excel 2003.
- Number and categories of fields: 10 fields. Categories:
- Catalogue number
- Parasite species name
- Author of the parasite species
- Host species
- Author of the host species
- Locality Name
- Collecting date
- Intensity
- Locality cordenates
- Number of entries: 505.
- Web site: under construction.

BIBLIOGRAPHY ASSOCIATED TO THE COLLECTION

Although the information contained in the collection has not been catalogued, a part of that information was formally published as an atlas of helminths of cichlid fishes from southeastern Mexico (Vidal-Martinez et al., 2001).

Special publications and list of specimens

Vidal-Martinez, V.M., M.L. Aguirre-Macedo, T. Scholz, D. Gonzalez-Solis & E.F.

Mendoza-Franco. 2001. *Atlas of the helminth parasites of cichlid fish of Mexico.* Academia, Praha, Czech Republic.

GENERAL INFRASTRUCTURE

The CHCM is housed in the laboratory of Parasitology and Aquatic Pathology at CINVESTAV-IPN Campus Merida. The physical space comprises 2 Aluminium cabinets exclusively for the catalogued specimens and one more for backup specimens.

PROCEDURES FOR INFORMATION, LOANS AND SERVICES

1. Requests of specimens must be made to the Collection managers via e-mail.
2. Loans are temporary (duration: 3 months, renewable twice) for the purpose of research. Borrowers must return the specimen(s) in the same manner in which they were sent (generally, via courier). Shipping costs are covered by the CHCM; on return to CHCM, material will be billed to the borrower.
3. Deposition of specimens must be accompanied by a letter containing the following data: Scientific name of parasite, scientific name of host, site of infection, locality of collection (including geographic coordinates), collector (s) name and date, identifier name and date, and number of specimens.

ACKNOWLEDGEMENTS

The authors are indebted to all the undergraduate, MSc and PhD students that have developed their thesis in the laboratory. Without their help, all the collection of data and processing of the material would have not been possible. Thanks are also due

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COLECCIÓN NACIONAL DE HELMINTOS (CNHE)

Instituto de Biología, Universidad Nacional Autónoma de México (UNAM)

RAFAEL LAMOTHE-ARGUMEDO, LUIS GARCÍA-PRIETO, DAVID OSORIO-SARABIA & GERARDO PÉREZ-PONCE DE LEÓN

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Financial support: Universidad Nacional Autónoma de México.

HISTORY

The Colección Nacional de Helmintos, housed at Instituto de Biología, UNAM, Mexico City, was founded in 1932 by **Eduardo Caballero y Caballero**, based on 50 lots of leeches collected around Mexico. Since then, the CNHE has had two main purposes: 1) to support the inventory work to describe helminth diversity from Mexico, through the collect and reception of specimens; and 2) the curation, and long-term maintenance of these specimens. Former curators were Eduardo Caballero y Caballero (1932-1960), **Margarita Bravo-Hollis** and **Jorge Caballero-Deloya** (1960-1980). **Rafael Lamothe-Argumedo** has been the curator since 1980. Currently all records have been incorporated into an electronic data base. This process allowed systematizing it, and linking the specimens to bibliographic information related to morphometric descriptions, host occurrence, geographic distribution, and other important data. At present, the CNHE is one of the largest and more dynamic collections of helminths in Latin America. In 1982, was included in the “*Guide of Parasite Collections of the World*” (Lichtenfels & Pritchard, 1982), and since 1997 is recognized as National

collection by the Mexican government. The collection is mainly constituted by specimens collected and identified by the staff and Mexican researchers as Leopoldina Aguirre Macedo, Juan M. Caspeta Mandujano, David González Solis, Sergio Guillén Hernández, F. Agustín Jiménez, Edgar Mendoza Franco, Scott Monks, Víctor Manuel Vidal Martínez, Griselda Pulido Flores, and Juan Violante González. In addition, an important portion of the material has been deposited by international donors including Janine Caira, Ronald A. Campbell, Daniel Brooks, Anindo Choudhury, Delane C. Kritsky, Harold W. Manter, Frantisek Moravec, and Tomas Scholz.

The inventory of the helminth parasites of wildlife vertebrates in Mexico is far from complete. A huge progress has been made since the collection was established 77 years ago; however, sampling effort requires the involvement of more systematists in the next years, with a concomitant increase in the infrastructure of the national collection to support systematic work and information retrieval to guarantee that deposited specimens will be kept safe in the future.

STAFF

CURATOR

Dr. Marcos Rafael Lamothe y Argumedo

Systematic and taxonomy of helminths, particularly trematodes and monogeneans.

ASSOCIATE RESEARCHERS

Dr. Virginia León Règagnon

Molecular systematic of helminthes, focused in parasites of amphibians and reptiles.

Dr. Gerardo Pérez Ponce de León

Phylogeny, systematic and biogeography of helminths, with special reference to parasites of freshwater fishes.

Dr. Guillermo Salgado Maldonado

Systematic and ecology of helminths of freshwater fishes; taxonomy of acanthocephalans.

COLLECTION MANAGERS

M. Sc. Luis García Prieto

Systematic and taxonomy of helminths, particularly cestodes.

M. Sc. David Osorio Sarabia

Systematic and taxonomy of helminths, particularly nematodes.

TECHNICAL ASSISTANT

Leticia Barragán Lira

Digitalization of reprints collection; maintenance of exposition and wet collections.

THE COLLECTION IN NUMBERS

- *NUMBER OF LOTS:* 7, 128.
- *NUMBER OF SPECIMENS:* 50, 029.
- *REPRESENTED GROUP OF HELMINTHS:* Turbellaria, Temanocephala, Aspidogastrea, Digenea, Monogenea, Cestoidea, Acanthocephala, Nematoda, Hirudinea.
- *NUMBER OF SPECIES: TOTAL:* 1622; Turbellaria: 15 species; Temanocephala: 6; Digenea: 606; Aspidogastrea: 3; Monogenea: 266; Cestoidea: 174; Acanthocephala: 67; Nematoda: 445; Hirudinea: 40.
- *NUMBER OF TYPES: Holotypes/paratypes: TOTAL:* 486/555; by group of helminth: Turbellaria 2/2; Temanocephala 1/3; Aspidogastrea 0/1; Digenea 122/184; Monogenea 123/129; Cestoidea 58/54; Acanthocephala 13/15; Nematoda 153/153; Hirudinea 14/14.
- REPRESENTED GROUP OF HOSTS

TABLE I.- REPRESENTED GROUP OF HOSTS

HOST GROUP	TEMANOCEPHALA	ASPIDOGASTREA	DIGENEA	MONOGENEA	CESTOIDEA	ACANTHOCEPHALA	NEMATODA	HIRUDINEA
INVERTEBRATES	6	0	8	0	1	4	11	1
FISHES	0	3	295	247	104	31	116	5
AMPHIBIANS	0	0	59	5	8	3	49	2
REPTILES	0	0	80	7	9	6	62	5
BIRDS	0	0	94	0	22	15	49	0
PLANTS	0	0	0	0	0	0	6	0
MAMMALS	0	0	70	0	31	10	152	3

ANNUAL INCREASE IN THE LAST DECADE

The global rate of annual increase of the collection is 18.2 species, 606 specimens, and 75.3 lots per year. However, in the last 10 years these rates raised to 99.4 species, 1488 specimens, and 300 lots per year.

During the last 10 years, 370 publications have resulted from research both in the CNHE and from specimens loaned from, or deposited into, the CNHE as types or vouchers.

GEOGRAPHIC SCOPE (NATIONAL)

Specimens have been collected in all 32 states of Mexican territory, with an heterogeneous representation; thus, states such Aguascalientes are represented by only 1 species, while in others as Veracruz, have been recorded 140.

GEOGRAPHIC SCOPE (INTERNATIONAL)

A total of 567 species of helminth collected in 37 countries have been deposited in the CNHE, including: Brazil (9 species; 2 holotypes); Canada (17; 0); Colombia (12; 0); Costa Rica (89; 20); Cuba (7; 1); Ecuador (18; 4); United States of America (83; 3); Ex-Sovietic Union (34; 0); Guatemala (24; 4); Hungary (13; 0); India (7; 6); Japan (13; 0); Nicaragua (35; 6); New Zealand (11; 0); Panama (128; 36), and Venezuela (23; 1). Eighty-three of the 567 species represent holotypes, 1 of them collected in crustacean hosts, 50 in fishes, 5 in amphibians, 13 in reptiles, 3 in birds, and 11 in mammals.

PRESERVATION OF MATERIAL

The specimens are preserved in 2 primary mediums: slides are mounted in Canada balsam; the wet collection is contained by vials inside amber glass flasks, both with conservative liquid: 96% OH (67%), Glycerin (5%), formaldehyde (7.2%), and distilled water (20.8%). Specimens in exposition are maintained in 96% alcohol. Two incipient collections established in 2008, preserve specimens prepared for scanning electronic microscopy (aluminum stubs stored in plastic boxes with silica gel), and

helminth tissues (contained by plastic vials with absolute alcohol, deposited in an ultrafreezer at -20°C).

DATA BASE

- Software: Microsoft Access 2003
- Number and categories of fields: 53 fields. Categories:
- Bibliographic: 9 fields.
- Curatorial: 7 fields.
- Geographic: 14 fields.
- Specimen: 23 fields.
- Number of entries: 6927.
- Web site: <http://www.ibiologia.unam.mx/Unibio>

BIBLIOGRAPHY ASSOCIATED TO THE COLLECTION

Information contained in the collection has been catalogued three times: 1973, 1979, and 1997 (Bravo-Hollis & Caballero-Deloya, 1973; Bravo-Hollis & Caballero-Deloya, 1979; Lamothe-Argumedo *et al.*, 1997, respectively). In 1973, the number of catalogued species was 687; in 1979, 64 species were add (totalizing 751), and 18 years later, the total number of species contained by the CNHE increased to 975. During the past 77 years, 1353 publications have resulted from research both in the CNHE and from specimens loaned from, or deposited into, the CNHE as types or vouchers. These publications include 158 theses (117 undergraduate, 28 masters and 11 doctoral), 45 chapter in books, 23 books, and 1127 papers (379 published in national and 748 in international journals). To date, a total of 800 of this publications have been digitalized (PDF format), being available upon request to Collection managers.

Special publications and list of specimens

Bravo-Hollis, M., & J. Caballero-Deloya. 1973. *Catálogo de la Colección Helminológica del Instituto de Biología.* Instituto de Biología, Universidad Nacional Autónoma de México, Publicaciones Especiales 2, Mexico City, 138 p.

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- Lamothe-Argumedo, R., L. García-Prieto, D. Osorio-Sarabia & G. Pérez-Ponce de León.** 1997. *Catálogo de la Colección Nacional de Helminos.* Instituto de Biología,

Universidad Nacional Autónoma de México- Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, Mexico City, 211 pp.

Pérez- Ponce de León, G., & L. García Prieto. 2001. Diversidad de Helmintos Parásitos de Vertebrados Silvestres de México. *Biodiversitas* **6**: 7-11.

GENERAL INFRASTRUCTURE

The CNHE is housed on the third floor of building “D” in the Instituto de Biología, UNAM, contiguous to the Laboratorio de Helmintología “Dr. Eduardo Caballero y Caballero”. The particular physical space of the collection comprises 46 m², divided in 3 rooms: 1) Curator office (independent); 2) Library room, with 7 metallic cabinets containing approximately 20 000 reprints, and one computer connected to a scanner. Library room is connected with 3) Collection room, which contain 8 wood cabinets with aluminum trays with capacity to 19 000 slides; three metallic cabinets to preserve the wet collection, conformed by 2300 amber glass flasks, and one safety deposit box to accommodate holotype specimens. In this room is also found a computer in which the collection’s data base is handled, as well as the main books related to helminth taxonomy. In additions, a small exhibition of 50 museum flasks, show the most common species of helminths in Mexico. The particular equipment of the collection include: 2 stereomicroscopes Leica 2000 zoom (45X), 1 light microscope Olympus CX40 equipped with a digital camera (Olympus SP350), and one drawing tube mounted in a light microscope Zeiss 4746209900. Finally, an incipient helminth tissue collection is preserved in a Thermo Fisher Scientific Ultrafreezer (Revco).

PROCEDURES FOR INFORMATION, LOANS AND SERVICES

1. Requests of specimens must be made to the Collection managers via e-mail.
2. Loans are temporary (duration: 3 months, renewable twice) for the purpose of research. Loans are made in the CNHE to individuals supported by research institutions,

at the discretion of the Curator. Borrowers must return the specimen in the same manner in which they were sent (generally, via courier). Shipping costs are covered by the CNHE; return of the material will be billed to the borrower.

3. Paratypes are loaned only when more than one exists in the collection. Holotypes are available for consultation in CNHE facilities, and exceptionally loaned under Curator permission.

4. Deposition of specimens must be accompanied by a letter contained the following data: Scientific name of parasite, scientific name of host, site of infection, locality of collection (including geographic coordinates), collector name and date, identifier name and date, and number of specimens.

5. Reprints collection is available (in PDF format) upon request to Collections managers.

ACKNOWLEDGEMENTS

To Virginia León-Règagnon for their kindly support to assist to the V Congreso Argentino de Parasitología, where the project to make the “Guia” arose.



COLECCIÓN HELMINTOLÓGICA Y DE INVERTEBRADOS RELACIONADOS

MUSEO DE HISTORIA NATURAL

Universidad Nacional Mayor de San Marcos (UNMSM)

LIDIA SANCHEZ

Avenida Arenales 1256, Jesús María, Lima 14, Lima City. PERÚ. Telephone: 4710117 anexo 23; Fax:
(511) 265 6819; e-mail: lidiarosa06@yahoo.es

Financial support: UNMSM.

HISTORY

The Department of Helminthology at the Museum of Natural History (UNMSM) began their work in 1962. **Dr. Luz Sarmiento**, responsible for the department, organized and established the Helminthological Collection with material collected in the practices of Systematic Zoology of the School of Science Biology and the first expeditions for study diversity of flora and fauna of Peru. At this time, the researchers who worked in the department were: **Dr. Luis Gonzales Mugaburu, Dr. Bertha Parra, Dr. Bertha Llanos, Dr. Norma Uyema, Julio Gonzales, Dr. Raul Verano,** and **Biologist Elizabeth Morales**. In 1992, Biol. Morales is designed head of the Department of Helminthology and Curator of the Collection. Three years later, the name of the department was changed to Department of Protozoology, Helminthology and Related Invertebrates to include a larger number of taxa to study and initiate collections representative of these groups in Peru.

In 1998, the Related Invertebrates Collection begins, including the following groups: Protozoa, Turbellaria, Nematomorpha, Rotifera, Annelida, Crustacea parasites

(Copepoda, Isopoda, Branchiura), Pentastomida, Bryozoa, Cnidaria, and Coelenterate. This scope extension determined a new change of name for the collection, being now named: Helminthological Collection and Related Invertebrates.

In 2002 Elizabeth Morales decided to retire from the work of the University and since then, the **Biologist Lidia Sanchez** is responsible for the Department and Collection. The Helminth Collection is the most important in Peru. This collection includes helminths (Monogenea, Digenea, Cestoidea, Nematoda, and Acanthocephala) of domestic and wildlife animals, as well as parasites of man. The collection is cataloged in a database with complete information on the helminths recorded, hosts, location and geographic data. Recently it is also considering the bibliographic information. Deposition of specimens is due to the contribution of national researchers, as well as foreign researchers that have been working with Peruvian material.

The research lines are related to the study of helminths in vertebrate and invertebrate wildlife hosts. The investigations are conducted with material obtained from the collections made by Department personnel and material provided by other departments of the Museum of Natural History.

STAFF

CURATOR

Biologist Lidia Sánchez

Fish parasites

ASSOCIATE RESEARCHERS

Biologist Patricia Salizar

Helminths of lizards

TECNICAL ASSISTANTS

Biologist Beatriz Suyo

Helminths of public health importance

Biologist Hugo Colquichagua

Oligochaeta

THE HELMINTHOLOGICAL COLLECTION IN NUMBERS

- *NUMBER OF LOTS*: 2910.
- *NUMBER OF SPECIMENS*: determination in the process.
- *REPRESENTED GROUP OF HELMINTHS*: Digenea, Monogenea, Cestoidea, Acanthocephala, Nematoda, Nematomorpha, Turbellaria.
- *NUMBER OF SPECIES*: TOTAL: 427 species identified. Digenea: 93 species; Aspidogastrea:3; Monogenea: 62; Cestoidea: 91; Nematoda: 164; Acanthocephala: 14.
- *NUMBER OF TYPES*: Holotypes/paratypes: TOTAL: 34/418; by group of helminth: Digenea 3/10; Aspidogastrea:1/1 ; Monogenea 16/9; Cestoidea 3/6; Acanthocephala -/8; Nematoda 11/384.
- *REPRESENTED GROUP OF HOSTS*

TABLE I.- REPRESENTED GROUP OF HOSTS

HOST GROUP	REPRESENTED GROUP OF HOSTS						
	TURBELLARIA	ASPIDOGASTREA	DIGENEA	MONOGENEA	CESTOIDEA	ACANTHOCEPHALA	NEMATODA
INVERTEBRATES	11	0	9	32	2	3	0
FISHES	116	133	151	174	0	64	0
AMPHIBIANS	31	2	20	167	0	15	0
REPTILES	13	0	12	124	0	1	6
BIRDS	31	0	95	172	0	57	0
MAMMALS	106	0	81	415	0	17	3

ANNUAL INCREASE

The growth of the collection is approximately 100 lots per year, considering the last 5 years.

GEOGRAPHIC SCOPE (NATIONAL)

The material deposited in the collection corresponds to various locations of 24 of the 25 geographic Regions that currently constitute Peru.

GEOGRAPHIC SCOPE (INTERNATIONAL)

We also have material from countries like Brazil, Canada, Chile, Colombia, Ecuador, Hungary, Japan, Mexico, UK, Czech Republic, Russia and USA. In some cases this material was collected by laboratory personnel and other donated by researchers from other countries.

PRESERVATION OF MATERIAL

The specimens in the Collection are kept preserved in alcohol at 70 and / or permanent slides.

DATA BASE

- Software: Microsoft Excel 2007
- Number and categories of fields: 55 fields. Categories:
- Bibliographic: 10 fields.
- Curatorial: 15 fields.
- Geographic: 09 fields.
- Specimen: 12 fields.
- Number of entries: 2910.
- Web site: Not available.

BIBLIOGRAPHY ASSOCIATED TO THE COLLECTION

It is planned to publish a catalogue of the collection, and a digital catalogue with pictures. The material in the collection has been the support of numerous thesis and research works conducted by Department staff, which allowed for several publications among which are synopses of information on Digeneans, Nematodes and Acanthocephala of Peru, all these publications were prepared by the staff of the Laboratory in collaboration with researchers from other institutions.

Special publications and list of specimens

Tantaleán M., L. Sarmiento & A. Huiza. 1992. Digeneos (Trematoda) del Perú. *Boletín de Lima* **11**: 47 - 84.

Sarmiento L., M. Tantaleán & A. Huiza. 1999. Nemátodos parásitos del hombre y de los animales en el Perú. *Revista Peruana de Parasitología* **14**: 9-65.

Tantaleán M., L. Sánchez, L. Gómez & A. Huiza. 2005. Acanthocephalan from Peru. *Revista Peruana de Biología* **12**: 83-92.

Morales E., L. Sarmiento, L. Sánchez, D. Floríndez & G. Lamas. 2005. Type material of helminthes in the Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, (MUSM), Lima, Peru. *Revista Peruana de Biología* **12**: 463-472.

GENERAL INFRASTRUCTURE

Currently, laboratory facilities are expanding with the construction of the second floor. This will provide better conditions for scientific collection and expanded laboratory area. The vials and the collection of slides are located in metal cabinets. Even though optical equipments are old, it is in perfect condition, we have two monocular optical microscopes, an inverted microscope and two stereoscopes, one with continuous zoom.

PROCEDURES FOR INFORMATION, LOANS AND SERVICES

Among the outreach activities that meet the department include: Consultation and advice. Literature for consultation. Analysis and identification of samples. Preparation of temporary and permanent material. For any request for consultation, loan or service shall send a formal letter on behalf of the curator who will proceed with the pertinent.