NO BONES
NEWSLETTER

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Section of Invertebrate Zoology
Department of Systematic Biology
National Museum of Natural History
Smithsonian Institution

CONTENTS: PAGE:

Deep-Sea Expeditions

Mike Vecchione

Mike Vecchione, Research Associate in the Department of Systematic Biology and Director of the NMFS National Systematics Laboratory, recently led two deep-sea research expeditions, both of which contributed to the Census of Marine Life (CoML). This was the third in a seasonal series of cruises to Bear seamount. The cruises contribute to two pilot projects of the CoML: the offshore biodiversity component of the Gulf of Maine CoML project, and the comparative material component for MAR-ECO (the CoML project examining the deep-sea ecosystem around the mid-Atlantic Ridge).

The first expedition was a trawling expedition (May 13-23, 2003) to Bear Seamount, off the New England coast, aboard NOAA's Fisheries Research Vessel Delaware II, and partly funded by NOAA's Ocean Exploration (OE) program. Included among the scientific party on that cruise were six graduate students from a deep-sea biology course that Mike Vecchione teaches at the College of William and Mary in Williamsburg, Virginia. This cruise collected fishes, cephalopods, crustaceans, and various invertebrates from depths of 1-2 km around an underwater mountain located just inside the US 200 mi Extended Economic Zone. Tissues were also collected for DNA analyses. The specimens collected will be divided between the permanent collections at the NMNH and Harvard's Museum of Comparative Zoology.

The second expedition (June 3-17, 2003), with funding from NOAA/OE and the Sloan Foundation, used the Russian Research Vessel Akademik Mstislav Keldysh and the deep-diving manned submersibles MIR1 and MIR2 to examine the fauna of the Charlie Gibbs Fracture Zone of the Mid-Atlantic Ridge. The subs were used to dive as deep as 4500 m and the U.S. and Russian participants were the first humans ever to visit this part of the ocean. The animals living on and near the bottom of the deepest part of the MAR-ECO study area were videotaped. Surprisingly high numbers of fishes,

The squid, Chiroteuthis mega, was collected in the vicinity of Bear Seamount. (Photo by Mike Vecchione)

continued on page 2

COVER STORY CONT.

sponges, and other animals were observed. Among the videotapes are detailed observations of a strange type of animal, probably a lophenteropneust (Hemichordata: Enteropneusta), about which very little is known. This was the first in a series of cruises planned to explore the deep-sea biodiversity of this remote and poorly-known area.

Observations on the distribution of marine mammals and seabirds were also recorded on both cruises.

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Please submit news or articles via email or disk by the 15th of the month prior to publication.

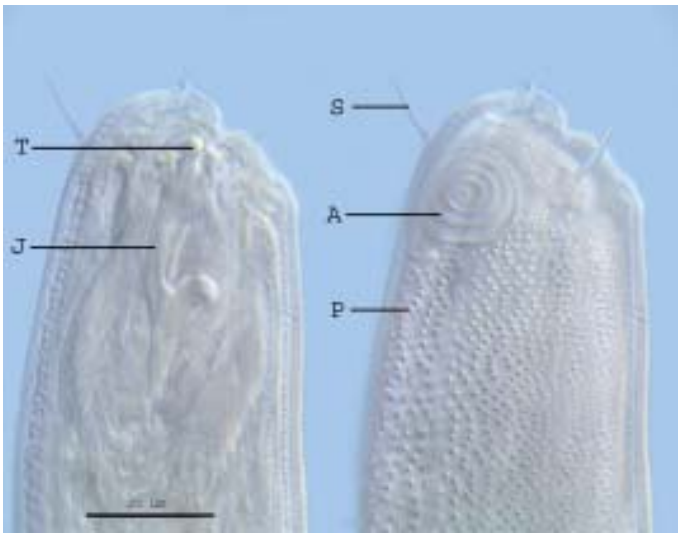
Publication in this newsletter does not constitute publication in a taxonomic or any other scientific context

RESEARCH

Rare Specimens and Six New Species of Marine Nematode Worms Found in IZ Collections

Duane Hope

Alexei V. Tchesunov, a professor at Moscow State University, has just concluded a month-long visit (July 1-27, 2003) with **Duane Hope**. Dr. Hope assisted Dr. Tchesunov who has been doing research in conjunction with Ju. Okhlopkov and D. Miljutin, students at Moscow State University, on marine free-living nematodes. He has studied specimens belonging to three families which were borrowed from the Smithsonian more than two years ago. During this visit Dr. Tchesunov has examined more specimens in the Smithsonian collections, especially those of the family Selachinematidae.



Marine nematode worm Cheironchus (digital composite images) - left image shows jaws (J) and teeth (T) in mouth, right image shows external features such as punctations in the cuticle (P), tactile hair-like sensory sensilla (S) on the head, and the spiral amphid(A), which is a chemosensory organ. (Photo by Duane Hope)

Eight species of the family Selachinematidae is contained in the Smithsonian collection, including two from the genus *Cheironchus* that are new to science. The collection also contains six specimens of the very rare genus *Trogolaimus* not found since its discovery in 1920. However, Tchesunov believes it may be a synonym of a genus described earlier.

Members of the Benthimermithidae are known mostly from the deep-sea. Specimens of this family in Smithsonian collections include six species of the genus *Benthimermis* with four new and two known species. Our extensive nematode collection includes several unique members of this family.

The third family, Rhaptothyreidae, continues to be a rare, poorly known, and extremely unusual nematode group since its description by Hope & Murphy in 1969. There are only two species known, *Rhaptothyreus typicus* and *R. minor,* both from the deep-sea. Dr. Tchesunov has used electron microscopy to obtain new information concerning the cuticle that covers the external surface of the body, and the various sensory organs it bears. The phylogenetic relationships of Rhaptothyreidae among other nematodes remains unknown.

ANNOUNCEMENTS

Dr. Robert Hershler Appointed as Invertebrate Zoology Section Head

The following is taken from an e-mail sent by **Ross Simons,** Director of SERC, on June 3, 2003:

We are pleased to announce that, effective August 4, 2003, **Dr. Robert Hershler** has agreed to become Head of the Section of Invertebrate Zoology. Dr. Hershler received his B.A. from SUNY at Stony Brook, and his M.A. and Ph.D. (1983) from Johns Hopkins University. Dr. Hershler joined the Smithsonian in October 1985. **Duane Hope** graciously agreed to act as Section Head from June 9, 2003 through August 3rd as Bob completed certain pressing projects.

Dr. Hershler is a specialist in the systematics, evolution, and biogeography of freshwater gastropods. Hershler is one of the best known malacologists in the US; his work in the Great Basin in Nevada involves geological as well as biological history, and thus has broader implications for paleontologists and hydrologists. Through such a thorough understanding of aquatic biodiversity issues in this area, Hershler's work has relevance for issues concerning threatened and endangered species.

Of late, Hershler and his co-editors David B. Madsen and Donald R. Curry have just published the Smithsonian Contributions to the Earth Sciences volume Great Basin Aquatic Systems History (number 33). This edited volume summarizes physical and biological aspects of the history of Great Basin aquatic systems and attempts to integrate the extensive contributions to this subject that have been made since the last such compendium was published in 1948.

In addition, Hershler recently received two grants, from the US Fish and Wildlife Service (USFWS) and a private company, to continue his long term study of the spring snails of western North America. Hershler's early work by necessity focused on field surveys and taxonomic descriptions in order to reasonably document this huge, poorly known fauna. More recently, his research emphasis has shifted to synthetic studies of the evolutionary history of this fauna and its relationship to the historical development of the modern western landscape and water drainage systems.

Dr. Hershler succeeds **David Pawson**, who has served as Head during the past year. Our thanks go to Dave for taking on this important assignment; Dave will return to his research on sea cucumbers.

TRAVEL

NMNH Director Visits Carrie Bow Cay

Klaus Ruetzler traveled July 21-30, 2003 to Carrie Bow Marine Field Station, Belize, to conduct research on the diversity and reproductive biology of mangrove sponges at Twin Cays. NMNH Director, **Cristián Samper** visited during that time to become acquainted with the lab and some of the ongoing reef and mangrove research, and to acquire scuba certification with SI Scientific Dive Officer Michael Lang. **Mike Carpenter** managed the facilities.

Dr. Samper inspecting the highly diverse sponge fauna on mangrove roots in the Pelican Cays, near Carrie Bow. (Photo by Klaus Ruetzler)

PUBLICATIONS

Klemm, D.J., **B.A. Daniels**, **W.E. Moser** & R.J.G. Lester 2003. Biology of the leech A*ctinobdella inequiannulata* Moore, 1901 (Annelida: Hirudinea: Rhynchobdellida: Glossiphoniidae), parasitic on the white sucker, *Catostomus commersoni* Lacepede, 1803, and the longnose sucker, Catostomus catostomus Forster, 1773, in Algonquin Provincial Park, Ontario Canada. Comparative Parasitology 70(2):120-127.

Kensley, B. 2003. Marine isopod crustaceans from Easter Island. Pacific Science 57(3):287-317.

COLLECTIONS

Gulf Invertebrate Collection Rescued

Josh Harris

A team from the Invertebrate Zoology department traveled to The University of Texas Marine Sciences Institute in Port Aransas, Texas from July 26 – August 1, 2003, in order to assess and retrieve collections held there. The team, consisting of **Kathryn Ahlfeld**, **Valorie Barnes**, **Josh Harris** and **Bill Moser**, were working under the auspices of the Department of the Interior's Mineral Management Service (MMS) Offshore Program.

The South Texas Outer Continental Shelf (STOCS) collection, was collected and has been stored at the Port Aransas lab since the mid-1970s. The National Museum of Natural History, being the designated repository for the MMS collections, was asked to transfer this material from Texas for permanent storage in the IZ collections.

The self-dubbed "Collections Rescue Squad" arrived at the UT lab to find roughly 2000 jars consisting of thousands of alcohol lots of marine invertebrates in what could be described as a dismal state. Designated to a back storage room, many specimen jars were in an inadequate state of preservation. It was clear that the collection had not been handled or utilized in any manner for a number of years.

Over the next several days the team secured the jar lids with Parafilm, wrapped each individual jar in bubble wrap and packed the collections into 30 gallon industrial drums. When finally packed, fourteen, 30-gallon drums were filled with the STOCS collection to be shipped back to NMNH.

Katie Ahlfeld and Valorie Barnes with 30 gallon drums used for shipping the marine invertebrate collection from The University of Texas Marine Research Lab. (Photo by Josh Harris)

Bill Moser and Josh Harris securing jar lids with Parafilm. (Photo by Valorie Barnes)

The team still managed to find some time to experience the Texas gulf culture, despite the grueling work. They enjoyed the local seafood and a search for the infamous Texas-sized cowboy hat and belt buckle. Other diversions included a few cocktails by the pool and even a rousing round of miniature golf.

The collections recently arrived safely back at NMNH and will gradually be catalogued and integrated as part of the permanent Invertebrate Zoology collections.

SPOTLIGHT ON STAFF

A Paleo Vacation

Lana Ong

Usually a vacation site is scenic, has interesting shopping and/or sightseeing. Rarely does it include digging in hard ground under a hot sun or moving heavy bags of soil around water-filled pits.

On July 11-19, 2003, three of my digging buddies (Lynn Aronoff, Susan Kloss and Lib Roller) and I find that areas with bones to be the perfect vacation spot. "Have tools, will dig for free".

Having recovered from sore hands from previous paleo digs, I decided to drive to the Gray Fossil Site, near Gray, Tennessee for a week-long dig. With the approval of the chief scientist I was able to join my friends who were already there. We were housed in individual rooms at a dorm, on the East Tennessee State University (ETSU) campus in Johnson City, a short drive from the dig. After working all morning, we would drive to a nice, air-conditioned restaurant for lunch. People looked really hard at us four dirt covered women, probably wondering if they would be stuck with us at an adjacent table.

Dr. Steven Wallace is the ETSU paleontologist and Larry Bristol is the On-Site Coordinator for the Gray Fossil Site. In 2000, during realignment and widening of State Route 75, bones and fragments were discovered.

Initially, the unusual geology was noticed by Tennessee Department of Transportation geologist Larry Bolt. Examining the black and gray layered clays, lead to a cooperative excursion, where bones and fragments were discovered. TDOT stopped work in the affected area to assess the site as a possible major fossil discovery. As a result of further discoveries, the road has been realigned to avoid the fossil deposit at the direction of then-Tennessee Governor Don Sundquist.

The bedrock setting suggested a karst feature such as a sinkhole pond, while laminated clays, with what appeared to be glacial dropstones, hinted at glaciation. Gravels and forset bedding required a fluvial connection, and the fractures and faults suggested slumping, compaction, or maybe even a record of earthquakes movements.

This site represents the first terrestrial Miocene deposit in Tennessee along with Miocene vertebrate, invertebrate and plant fossils. Aquatic invertebrates include ostracods, snails (probable Planorbidae, possible Viviparidae), and small fingernail clams (Sphaeridae), occurring in many layers. Land snail shells similar to *Anguispira* (Discidae) have been found. Vertebrate fossils recovered include the remains of shovel-tusked elephants (*Gomphothere*), rhinos (*Teleoceras*), tapirs, alligators, peccaries, fish, frogs, salamanders, snakes, turtles, bear, cat, a jackal-like animal, a small songbird and a large otter. The tapirs, the most abundant species, resemble the South American mountain tapir.

During the two weeks that the site was worked, we found mostly tapir bones, including skulls and turtle shell parts. Other finds include a possible camel (or elk?) molar, a rhino tooth, large cat tooth fragments, a tiny snake vertebrae and the jaw of a short faced bear. On the last day, we dug around a 12-14 inch round tree trunk. Who knows what is under it or how deep it goes. We may find out next year. To paraphrase Dr. Wallace, 'You are coming back, aren't you?'. Free help is hard to find.

The Gray Fossil Site information for this article is from:

http://members.aol.com./Graysite1

http://www.tdot.state.tn.us/information-office/press.htm

http://www.geocites.com/graysitefriends

http://www.tdot.state.tn.us/Chief_Engineer/assistant_engineer_operations/materi~1/geotech/GrayFossilSite.htm

Lana clearing newly dug soil to expose fossil material. (Photo by Susan Kloss)

TRAVEL CONT.

Invertebrate Workshop at Bocas del Toro, Panama

Geoff Keel

Several IZ staff members recently took part in an Invertebrate Workshop (August 2-15, 2003) conducted through the Smithsonian Tropical Research Institute (STRI) at the new facilities at Bocas del Toro, Panama. The workshop was organized by STRI researcher Rachel Collin, who is the head of the Bocas lab, in an effort to collect and identify species from several different phyla that are present in the variety of environments surrounding Bocas del Toro.

Staff members representing the Department of Invertebrate Zoology included **Kristian Fauchald, Geoff Keel** (Polychaetes), **Jon Norenburg** and **Megan Schwartz** (Nemerteans). Other non-SI participants included Leslie Harris and Kirk Fitzhugh (Polychaetes), Gordon Hendler (Ophiuroids), Juan Sanchez (Gorgonians), Rosanna Rocha (Ascidians), Christina Diaz (Porifera), and Rachel Collin herself (Mollusks). Several STRI staff members assisted in the operations including Gabriel Jacome, Willie Pomaire and Arcadio Castillo.

Many in the group had worked together in the past on other research projects. That familiarity with each others research interests facilitated the discovery of several new species through the sharing of material and information from the many stations sampled during the workshop. The specimens and information gathered there was also enhanced by Leslie Harris, who took every opportunity to photograph the amazing variety of live invertebrates. Of course, many invertebrates that were not represented by a researcher at the workshop were seen crawling out of the coral rubble or seagrass that was collected every day.

For most of the researchers this was their first opportunity to collect in northwestern Panama. By the end of the conference most were making plans to return to try and fill in gaps left when time ran out.

The new lab facility at Bocas del Toro, Panama. To the left of the bridge are two large labs for groups of researchers as well as several smaller labs for individual long term researchers. To the right of the bridge is an office and a library. (Photo by Geoff Keel)

Hennig XXII Meetings

On July 20 - 25, 2003, **Kristian Fauchald** and **Bill Moser** attended the Willi Hennig XXII Society meetings in New York City. They took part in the symposium, The Worm's Turn: Advances in Annelid Phylogeny and Evolution. At the symposium, Kristian Fauchald presented the talk, "So Many Worms, So Little Time".

OUTREACH

Invertebrate Zoology Reaches Out....

With help from a grant awarded to **Dave Pawson** by the Smithsonian Women's Committee, staff members of Invertebrate Zoology will soon be seen in the public areas of the NMNH, telling visitors what we do, and why we're doing it. We will have, on tables and carts, interesting displays of some of our animals – crabs, sea shells, worms, sea stars, corals, etc., with experts there to explain our research and to answer questions. Women's Committee funding will enable us to distribute attractive brochures telling more about our animals, and providing lists of websites and publications where more information can be obtained.

NEW FACES

Gretchen Carpintero

I'm currently a student at The George Washington University, with a major in Chemistry/Biochemistry and a minor in Biology. I got involved in the Cerion project while working with the late Professor Glenn Goodfriend at the University three years ago. In our laboratory, we studied the amino acid racemization to determine the age of fossil Cerion shells. The late Prof. Stephen J. Gould from Harvard University was involved in morphometric analyses of the shells, and **Dr. Jerry Harasewych** from the National Museum of Natural History, investigated the population genetics and molecular evolution of Cerion populations living near the fossil sites.

The goal of the research is to study the dramatic patterns of geographic and temporal variation in the shell form of the land snail Cerion. To do this, a research team led by Drs. Goodfriend, Gould and Harasewych, and including **Yolanda Villacampa** (NMNH, IZ), Steve Pappas (Department of Education) and myself (GWU), traveled to Long Island in the Bahamas in 2001. This island showed an excellent fossil record of Cerion, perfect for us to study. After collecting specimens for a couple of weeks we ran tests that are currently being analyzed at the Smithsonian. We are tracing out the patterns of morphological gradients represented by specific samples. Although our current research has been very successful we have also been investigating future options which would open new dimensions to our current research.

Gretchen with sorted Cerion fossil shells collected from varying strata. (Photo by Yolanda Villacampa)

My time here at the Smithsonian has been very rewarding and satisfying not only because it has given me the opportunity to study a different aspect of the project but also because it allows me to grow and learn more every day as an aspiring scientist.

BOOKREVIEW

Book Review

Lou Kornicker

"In the Blink of an Eye," by Andrew Parker, Oxford University, Perseus Publishing, first printing April, 2003, 316 pages. I obtained my copy from Amazon.com ($17.47).

The book is an in-depth attempt to explain the *why* of the Cambrian explosion of life forms.

Presented below are two paragraphs extracted from the book that reflect positively on the Smithsonian's impact on widely ranging scientific disciplines.

"Lou Kornicker of the Smithsonian Institution in Washington, DC, had produced taxonomic publications the size of telephone directories on lightweight seed shrimps [ostracods] including notched seed-shrimps. His work provided a reliable database of body parts and the variety of forms of notched seed-shrimps. And an evolutionary tree was inferred at last. (p. 159)"

"Part of my work on seed-shrimp iridescence described in Chapter 5 was carried out at the National Museum of Natural History of the Smithsonian Institution. Originally I had found diffraction gratings in some seed-shrimps from Australia and needed to examine as many other species as possible. The world's expert on this group of animals is Louis Kornicker at the Smithsonian, and it is no coincidence that the best collection of seed-shrimps is found there, too. So it was only natural that I should apply for funding to work in Washington. My application was successful and in 1995 I began working on the Smithsonian collection. (p. 180)"

Parker shows a deep understanding and appreciation of the work of the Smithsonian. The book is provocative, and I definitely intend to read it.

VISITORS

Rosemarie Baron-Szabo, Knoxville Institute of Paleontology, Knoxville, Tennessee (06/18-06/20), examined Mesozoic scleractina at MSC. **Sponsor: Steven Cairns.**

David Gibbs, Arlington, Virginia (06/23-07/03), intern/volunteer, worked on the octocoral collection. **Sponsor: Steven Cairns.**

Allan Lerner, New Mexico Museum of Natural History, Albuquerque, New Mexico (06/27), examined Branchiura and Anaspidaecea crustaceans. **Sponsor: Chad Walter.**

Sergio Salazar-Vallejo, ECOSUR, Chetumal, Mexico (6/30-10/30) is here on a Fullbright Fellowship to study the polychaetes of the family Flabelligeridae and their relationship to other polychaetes. **Sponsor: Kristian Fauchald**

Jason Kinser, George Mason University, Manassas, Virginia (07/01), discussed image analysis of mollusks. **Sponsor: Jerry Harasewych.**

Patrick Gillevet, George Mason University, Manassas, Virginia (07/01), discussed heteropod project. **Sponsor: Jerry Harasewych.**

John Clamp, Department of Biology, North Carolina Central University, Durham, North Carolina (07/02-07/03), studied peritrich ciliates epizoic on amphipods. **Sponsor: Rafael Lemaitre.**

Robert Haynes, Montgomery County Education Foundation, Mt. Sterling, Kentucky (07/09), participated in the echinoderms workshop conducted by C. Ahearn for the Adventures in Learning Programs in Science (ALPS).

Maya Maini, University of Richmond, Richmond, Virginia (07/17), discussed shell collection storage procedures and shell identifications. **Sponsor: Jerry Harasewych & Yolanda Villacampa.**

Ben Oliavar, University of Florida, Gainesville, Florida (7/18) was given a general tour of IZ as well as an echinoderm presentation from Cindy Ahearn. **Sponsor: Cindy Ahearn**

Leen Ofwegen, Naturalis (National Museum of Natural History, Leiden Museum) Leiden, Netherlands (07/21-07/26), examined the octocoral collection and consulted with Drs. **F. Bayer and S. Cairns. Sponsor: Steven Cairns.**

Andrew Rhyne, Florida Institute of Technology, Department of Biological Sciences, Melbourne, Florida (07/21-07/25), studied specimens from the peppermint shrimp complex (*Lysmata* spp.). **Sponsor: Rafael Lemaitre.**

Bert Hoeksema, Naturalis (NMNH, Leiden Museum), Leiden, Netherlands, (07/22-07/25), examined scleratinia corals and consulted with **Steven Cairns. Sponsor: Steven Cairns.**

Dennis Opresko, Oak Ridge National Lab., Oak Ridge, Tennessee (08/4-08/8), studied deep-sea black corals. Sponsor**: Steve Cairns.**

LIBRARY

INVERTEBRATE ZOOLOGY LIBRARIES NEW TITLES

D'Udekem d'Acoz, Cédric. **Inventaire e distribution des crustacés decapods de l'Atlantique nord-oriental, de la Méditerranée et des eaux continentals adjacentes aunor de nord 25° N.** Patrimoines Naturels, No. 40. Paris: Service du Patrioine Naturel, Institut d'Écologie et de Gestion de la Biodiversité, 1999. QL 444 M33 D83 1999 INVZ

Gosling, Elizabeth. **Bivalve Molluscs: Biology, Ecology and Culture.** Bodmin, England: Fishing News Books/Blackwell Publishing, 2003. QL 430.6 G67 2003x MOLL

Jayachandran, K. V. **Palaemonid Prawns: Biodiversity, Taxonomy, Biology and Management.** Enfield, N. H.: Science Publishers, Inc., 2001. QL 444 M33 J39 2001x INVZ

Lee, Donald (ed.) **The Biology of Nematodes.** London and New York: Taylor & Francis, 2002. QL 391 N4 B55 2002 INVZ

Landman, Neil H. et al. **Pearls: A Natural History.** New York: Harry N. Abrams, Inc./American Museum of Natural History, 2001. QL 430.7 P77 P43 2001x MOLL

Narciso, Ricardo. **Camarões e Lagostas da Costa Continental Portuguesa.** Mem Martins, Portugal: Câmara Municipal de Cascais, 2002. QL 444 M33 C16 2002 INVZ

Nielsen, Arne Thorshøj. **A Catalogue of Ordovician Agnostid Trilobites.** Geological Museum of the University of Copenhagen Contributions to Palaeontology No. 476. Copenhagen, Denmark: Geological Survey of Denmark and Greenland ,1999. QE 823 A35 N54 1999 INVZ