Featured Researcher

Samuel Crane

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Academic Background
Bachelor of Science in Biology, University of Washington, WA - 2005
Ph.D. Student in Biology: Ecology, Evolutionary Biology and Behavior Program, Graduate Center, City University of New York, NY - 2006 to present
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Research interests
Biogeography, population genetics and molecular systematics of the New World genus *Conotrachelus*, biodiversity informatics and agricultural ecosystems.

Weevils cause damage to many of our most important crops. The plum curculio, *Conotrachelus nenuphar* (Herbst), is one such weevil. The plum curculio is native and endemic to the eastern United States. Native hosts include hawthorn trees, crabapple trees, and the Chickasaw plum. After the introduction of domesticated fruit trees, the plum curculio began using crop trees as hosts. Now, its pest status well established, the plum curculio is a problem in commercial fruit production for a number of trees in the Rosaceae family - including plums, peaches, and apples. Accordingly, “it is the considered opinion of entomologists that plum curculios, not gravity, cause apples to fall” (Berenbaum 1991). The plum curculio is the focus of my doctoral research at the American Museum of Natural History in New York. I am using genetic techniques to investigate the history and demographics of this important crop pest as well as the evolutionary relationships among its congeners.

Perhaps unconventionally, concern over environmental problems drove me to this system and to weevils generally. I have long been interested in questions of origins and wanted to use evolution as a lens for examining environmental problems. This question-driven approach to science along with a natural fondness for beetles led me to the mega-diverse and economically important weevils. The plum curculio itself was suggested to me by Charlie O’Brien.

Adult female plum curculio oviposit in the immature fruit, leaving a telltale crescent-shaped scar. The tiny larvae burrow into the seed cavity where they spend several weeks maturing. Infected fruit drops from the tree prematurely and the grub emerges from the fallen fruit to excavate a small cavity in the soil. There it pupates and the adult weevil emerges a month or more later. In the North, these adults represent the only gene-

(continued page 2)
Editorial Comments

Welcome to volume 56 of CURCULIO! As usual the issue is out a little later than expected; however, it is always nice to see it come together at the end. I am grateful to everyone who sent me their information and updates on weevil research. The "new face" this time is Samuel Crane (American Museum of Natural History, New York), who is working towards a dissertation on the molecular phylogenetics of the plum curculio and relatives. Let me use this opportunity as a reminder that our Newsletter is always looking for (typically) early career scientists to be featured on the next issue’s front page. In fact, finding someone who is willing to do so has often been the most difficult task when putting together past issues. It is probably easier to be recommended by an advisor than to volunteer personally. I would therefore like to send a strong message to anyone advising a promising young weevil researcher to help us out in this context. To finish up the housekeeping section, I should reiterate that I remain quite open to suggestions for improving CURCULIO, ranging from technical to more profound issues.

Since the appearance of the previous volume, two of the most accomplished weevil experts of past five decades have celebrated important anniversaries. Horace Burke, the Newsletter’s co-originator and most prolific contributor turned 82 years on April 1, 2008. Meanwhile Charles O’Brien, [insert your preferred weevil-related superlative here], turned 75 years on March 27, 2008. Henry Hespenheide, in response to a message sent out by George Benn Marshall who worked with the O’Briens for many years, made the fitting remark: “George! It’s nice to communicate with you as a co-collector of Charlie and Lois - I’ve seen your name on many collection labels! My question is when is Lois’ birthday? Much of Charlie’s success is due to Lois’ support - they are very much a team whose whole is greater than the sum of their parts. They are “C.W. & L.B. O’Brien” [and “G.B. Marshshall”], or, better, CharlieandLois.” Naturally, ‘both’ Horace and CharlieandLois have news for this volume (pages 5 and 12, respectively). We wish them the best and look forward to seeing them at the upcoming Entomological Society of America (ESA) meetings in Reno, Nevada.

The volume is rounded out by contributions from Adriana Marvaldi who ably summarizes the papers given at the Weevil Symposium held at the 2007 ESA meetings (page 9); and from Robert Anderson who reviews a new volume on the entimine weevils of Canada and Alaska (page 11). Enjoy reading this new issue and be sure to contribute next time!

Samuel Crane (continued)

ration each year and they spend the rest of the season feeding on fruit and foliage in anticipation of overwintering. Southern plum curculio will go through another generation. The limits of the weevils’ distribution extend as far west as the 105th meridian, though records west of the 97th meridian are rare. The northern population limits reach into Canada and the southern population limits fall just short of the Gulf coast.

I currently have samples from 10 populations and am working on expanding this collection. Soon I hope to have comprehensive coverage across the known range of this fruit pest. These samples are preserved in 100% ethanol and stored at either -20°C or in liquid nitrogen. Upon collection and receipt of specimens, I process them in the laboratory for a variety of molecular loci, including cytochrome oxidase I (COI), cytochrome oxidase II (COII), and NADH dehydrogenase 5 (ND5) from the mitochondrial genome. Present plans include the application and use of hypervariable nuclear loci (i.e., microsatellites) which will be informative about recent demographic trends and possible responses to climate and habitat alterations. This work is being conducted at the Sackler Institute for Comparative Genomics at the American Museum of Natural History (see http://www.genomics.amnh.org). Tissue storage is provided by the Ambrose Monell Cryo Collection (http://research.amnh.org/amcc). My goal is to use the information gleaned from these population genetic studies to enhance our knowledge of the plum curculio as a native weevil and inform our management plans of the plum curculio as an agricultural pest.

Other work includes building environmental niche models
and resolving the systematics of the genus. Environmental niche models (ENM) can profile suitable habitats by correlating data about the environment (e.g., temperature, precipitation, soil type) at locations where the species is found. The ENM then allows for discovery of unsampled areas with potentially suitable conditions. Preliminary results show a tight correspondence between the species distribution and areas predicted to be suitable. More interestingly, the northern and southern strains of the plum curculio yield different predictions when modeled separately. If additional study corroborates this result, the plum curculio ENM may have important implications for management plans.

There has been no systematic treatment of Conotrachelus Dejean since Fiedler (1940) and Schoof (1942). This may be explained in part by the fact that there are more than 1200 named species in this New World genus. I will attempt to rectify this situation by testing Schoof’s (1942) treatment of the genus. This key provides descriptions and morphological characters for 28 species occurring in the north-central United States. I will use a combination of museum and fresh field-collected specimens in a molecular systematic analysis to test Schoof’s (1942) groupings and make a preliminary assessment of sister species status for my focal species. Based on this work I will take a representative sampling approach towards a genus-wide treatment, pending access to the most important specimens.

All of this work fits within my broader goals of using evolutionary biology to examine issues in the agricultural and environmental sciences while simultaneously enhancing our knowledge of life’s diversity. After I earn my Ph.D., I will continue using my skills to investigate tough environmental problems and hope to expand my work with weevils of economic importance by means of ecological, genomic, and bioinformatic tools. Weevils play important roles, both beneficial and harmful, in agroecosystems. Only by understanding these types of interactions can we hope to implement effective management plans that will allow necessary increases in productivity while minimizing the disruptive impacts of agricultural landscapes.

As a final note, I have developed and am managing a new on-line directory of researchers who work with weevils. The directory, called Weevil Workers, can be accessed at http://weevils.amnh.org. I encourage anyone working with weevils to include themselves in the directory. To be included, visit the website and follow the directions posted there. The purpose of the website is to enhance communication between weevil researchers, to facilitate access to weevil specialists, and to promote the dissemination of information about weevils, a significant component of earth’s biodiversity. Please visit the website and spread the word.

Request - Conotrachelus Specimens
I am interested in all Conotrachelus specimens. The following species are of particular interest: Conotrachelus nenuphar (plum curculio), C. juglandis, C. buchanani, C. albicinctus, and C. iowensis. Specimens of the plum curculio from west of the Mississippi would be especially useful. Loaned specimens will be processed for DNA analysis using a non-destructive extraction protocol when possible or, with permission, by having a hind leg removed. Donated specimens will be accessioned into the American Museum of Natural History’s permanent frozen tissue collection.

References

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Research Activities and Requests for Specimens

**Roberto Caldara** (Italy: r.caldara@tin.it). With regards to the Mecinini, the revision of Palearctic *Gymnetron* is in press, whereas the revision of the Palearctic *Mecinus* is nearly completed and the revision of the Palearctic *Rhinusa* is in progress. Also the revision of *Picia* (Eriphinidae) is nearly completed.

**Mahmut Erbey** (Turkey: merbey@gazi.edu.tr). Currently enrolled as a doctoral student at the Ahi Evran Üniversitesi in southern Turkey and studying Curculionidae.

**Nico Franz** (USA: franz@uprm.edu). Continuing his studies of Neotropical weevils. The revision of *Cotithene* has been published in *Zootaxa*. A manuscript describing a new genus and species of Eustylini from southwestern Puerto Rico, co-authored with graduate student Jennifer Girón, is in press in Neotropical Entomology. A manuscript with redescriptions of critical type species in the Entimae: Eustylini is nearing completion. Has completed collecting trips in the summer of 2008 to Mona Island (Puerto Rico; one week) and to the Dominican Republic (three weeks), as part of the Caribbean *Exophthalmalus* project. The trip to Mona Island produced 24 weevil species (including platypodines and scolytines), up from 8 species that were included in the most recent summary [Ramos, J. A. 1946. The insects of Mona Island (West Indies). *Journal of Agriculture of the University of Puerto Rico* 30: 1-74]. The potentially new reports include species of *Anthomonus*, *Conotracelus*, *Cossanus*, Anchonini, and a possibly new and endemic species of Entimae. The weevil material from the Dominican Republic is still being sorted and mounted, but likely includes several new species of *Apodrosus* Marshall. Graduate students Jennifer Girón, Juliana Cardona, and Anyi-milehidi Mazo are currently associated with our lab and work on weevil systematics; see http://academic.uprm.edu/~franz/. Among other news, thanks to a NSF collection enhancement grant, we will upgrade the UPRM invertebrate collection in the coming three years, including a new infrastructure of cabinets (etc.), databasing and imaging of Puerto Rican insects. We invite specialists to travel to Puerto Rico and join us for field trips and other entomological activities, and are available for exchanging weevil specimens, primarily from Puerto Rico and surrounding Caribbean islands.

**María Guadalupe del Río** (Argentina: gadelrio@fcnym.unlp.edu.ar). Currently undertaking a taxonomic revision of *Naupactini* genera from the high Andes, especially *Amirus* Schoenherr, *Amphideritus* Schoenherr and *Asymmatheites* Wibmer and O’Brien, and a phylogenetic reconstruction of the *Naupactini* using morphological evidence. Working towards her Ph.D. thesis at the Universidad de La Plata, Argentina, under the direction of Dr. Analía Lanteri and Dr. Adriana Marvaldi.

**Noelia Guzmán** (Argentina: noneguzman@yahoo.com.ar). Conducting a phylogeographic study of *Naupactus xanthographus* (Germar), *N. leucoloma* Boheman, and *N. minor* (Buchanan), as part of her Ph.D. thesis at the Universidad de Buenos Aires, Argentina, under the direction of Dr. Analía Lanteri and Dr. Viviana Confalonieri.

**Luigi Magnano** (Italy: luigimagnano@libero.it). Interested in Curculionidae, especially Entimae. Currently studying the species of the tribe Otiorynchini for the compilation of a catalogue for the Palearctic species. Would appreciate receiving *Otiorynchus* species for study from Turkey, Greece, and from Central Asia.

**Helio Pierotti** (Italy: hpierotti@notariato.it). Interested in studying and exchanging *Peritelini* from Europe and in purchasing *Peritelini* from Europe, North Africa and North America.

**Marcela Rodríguez** (Argentina: rodrigueza@ege.fcen.uba.ar). Studying the presence of the endosymbiotic bacteria *Wolbachia* in parthenogenetic species of the tribe Naupactini (Coleoptera: Curculionidae) and their relation to phenomena such as polyploidy, apomixis, and colonization capacity. Also carrying out a phylogeographic study of *Naupactus cervinus* Boheman. Both projects are part of her Ph.D. thesis at the Universidad de Buenos Aires, Argentina, under the direction of Dr. Analía Lanteri and Dr. Viviana Confalonieri.

**María Rosas Echeverría** (Mexico: maventurar@yahoo.com.mx). Studying the species of *Pantomorus* Schoenherr from Mexico, using molecular and morphological characters. Working towards her Ph.D. at the Universidad Nacional Autónoma de México under the direction of Dr. Juan José Morrone, with the tutorial advice of Dr. Analía Lanteri. Visiting the Museo de La Plata from February to June, 2008.

**Antonio Velázquez de Castro** (Spain: velazquezdecastro@wanadoo.es). Currently working on a website with photos of Iberian insect fauna; see www.insectariumvirtual.com. Nearly 300 photos of Curculionoidea have been posted so far, and are ordered according to subfamilies and tribes; see http://www.insectariumvirtual.com/galeria/Superfamilia-Curculionoidea-cat138.html. Also working on the fauna of Sitonini of Israel and North Africa.
Notable Weevil Specialists of the Past

By Horace R. Burke (USA: hrburke@tamu.edu)

As we have seen in previous columns about “Notable Weevil Specialists”, general coleopterists of the past have occasionally gravitated toward specialization on weevils. Some, like Herbert S. Barber, never completely made the switch to weevils but still contributed significantly to the biology and taxonomy of the group. Barber is yet another of several United States Department of Agriculture (USDA) entomologists stationed in Washington, D.C. who studied and wrote about weevils as part of their official duties. Barber’s life and overall contributions to the knowledge of Coleoptera have been well documented by Anderson et al. (1950), Snyder (1950), Hall (1950), and Mallis (1972). Drawing upon these sources, an abbreviated biographical account of him is presented here as a basis for a more specific assessment of his work on weevils. I am indebted to Jens Prena for his incisive review (quoted below) regarding Barber’s few, but significant, papers on the Baridinae. The photograph included here is from an obituary of Barber that Anderson et al. (1950) published in the Proceedings of the Entomological Society of Washington.

Herbert Spencer Barber (1882-1950)

Herbert S. Barber was born in Yankton, South Dakota, on April 12, 1882. As with many of our predecessors, we know little about his early life. Thanks, however, to USDA colleagues who worked closely with him we do know that his father was an engineer whose work in land surveying offered many opportunities for Herbert to accompany him and experience outdoor life. Being outside, often camping in remote places for extended periods of time, he became familiar with a broad range of plants and animals, an interest that his natural science-oriented father promoted. His gradually developing fascination for insects was further encouraged by a book on British insects that his father gave him when he was 10 years of age. While this book was far from being an adequate guide to local insects, Herbert Barber was first employed by the USDA in 1901, immediately following an extended collecting trip with Schwarz to Arizona and New Mexico. He served in the USDA until the summer of 1904 when he was transferred to the USNM. In 1908, he joined the USDA for the second time and served in the Division of Insect Identification, Bureau of Entomology and Plant Quarantine, until his death in 1950. Between the USNM and the USDA, Barber was employed in entomology for about 50 years. He died at his home in Washington, D.C., on June 1, 1950, studying beetles to the last and leaving much unpublished work in note and manuscript form.

Barber’s contributions to entomology were many and highly varied. He was first of all a coleopterist with an interest in all aspects of the taxonomy and biology of beetles. As did Schwarz, he had an abiding interest in small and elusive species, espec-
Herbert S. Barber (continued)

particularly those demonstrating unusual development and behavior. For example, his two papers (Barber 1913a & 1913b) on *Micromalthus debilis* LeConte - with its complicated life cycle involving hypermetamorphosis, paedomorphosis and parthenogenesis - are classics in beetle biology. It took a while for some entomologists to accept the fact that Barber’s observations on this remarkable species were correct. Termitophiles and myrmecophiles as well as luminescent species such as *Phengodes* and lampyrids also held great appeal for him. His work on phytophagous species in Chrysomelidae and Curculionidae stems mostly from taxonomic problems encountered in his USDA work and generally involved species of at least some economic importance. The need for names and identification aids in his capacity as an insect identifier in the USDA generally dictated the direction of his study on these groups. The true breadth of Barber’s interest and contributions to the knowledge of Coleoptera may be best appreciated by perusal of his bibliography (Blackwelder 1950).

According to Anderson et al. (1950), Barber’s publications are characterized by “merit, not bulk.” Many of the 90 articles he published consist of short notes. Perhaps his publication of so many brief papers was influenced to some degree by the habit of Schwarz who often presented his observations in this manner. In Barber’s defense, it should be noted that his job responsibility in the USDA was insect identification rather than research. Along with providing what must have been thousands of identifications, he was often called upon to give time-consuming advice on nomenclatural and biological matters as well as to serve in a curatorial capacity. This service work significantly reduced the time he had available for research and publishing, thus encouraging the production of short papers as an outlet for his many, and often remarkable, observations on insects.

The extensive insect collecting that Barber did throughout his career deserves special mention. His first major collecting expedition was with E. A. Schwarz to New Mexico and Arizona in 1901. Schwarz wrote several interesting letters, edited and published by Sherman (1929), to L. O. Howard describing their experiences on this trip. Always quick to criticize collectors who did not live up to his high standards, Schwarz claimed that Barber’s collecting suffered from lack of experience. He even wrote to Howard that “Herbert shows but little circumspection and never collects anything of value if I am not with him.” However, the two managed to accumulate a large amount of excellent material even though their first month’s collection was destroyed in a hotel fire, Schwarz was ill with a respiratory problem for a time, and at first Barber was badly bothered by the heat and lack of water. Barber obviously overcame both the “circumspection” problem and the lack of experience to become a superb collector, perhaps even living up to the high expectations of Schwarz. Many opportunities soon came for Barber to expand the geographic coverage of his insect collecting. Trips were made to California in 1903 and to Texas in 1904. His first tropical experience came in 1906 when he accompanied Schwarz and botanist O. F. Cook on an expedition to Guatemala to study enemies of the boll weevil. Schwarz wrote several letters to various correspondents describing some aspects of the trip (Sherman 1929). Barber’s interest in tropical beetles was considerably heightened by the Guatemalan trip. Over the years he also collected in Mexico and throughout a large part of the United States. In 1910, Schwarz and Barber spent three weeks in southern Florida, mainly at Paradise Key, where they collected “well above 500” species of beetles. A brief account of this trip is included in Barber (1920). Another collecting trip to the Cape Sable area of Florida undertaken in 1919 with termite specialist Thomas E. Snyder and ornithologist Alexander Wetmore also resulted in important collections being made. When not on the road to distant localities in search of their beloved beetles, Schwarz and Barber concentrated on collecting along the banks of the Potomac River and in other places in close proximity to Washington, D.C. One of their favorite collecting localities in the area was on Plummer’s Island, a rocky shrubby island about 12 acres in size in the Potomac River a few miles from the city. A long term project was established to survey the insects of the island. Barber and Schwarz collected extensively together there for many years and Barber continued after Schwarz’s death and up to within a few days of his own death in 1950. The two would often leave their offices after work and spend time collecting and studying the beetles on the island before nightfall or they would even occasionally spend the night there to return to their jobs early the next day. Of the approximately 600 species of beetles now known to occur on the island, Barber and Schwarz surely collected a very large percentage. It is also worthy of note that they not only collected adult beetles but reared or otherwise associated the immature stages of many species with adults in order to expedite identification. Much biological information was obtained during this process. Barber is credited with collecting many interesting and rare insects, sometimes including “firsts” for the country. He occasionally entertained prominent foreign entomologists by taking them on local collecting trips in the Washington, D.C. area as well as sometimes treating them to shooting white water rapids in a canoe.

Barber’s first paper on weevils was published in 1912 on an avocado weevil (*Heilipus lauri* Boheman). This began a long-time interest in weevils attacking tropical fruits. His interest was expanded to cover orchid pests. Barber’s weevil publications resulted from his job responsibilities in the USDA and most of the papers he wrote dealt with economically important wee-
vils. His papers mixed descriptive material with sometimes extensive notes on life histories and damage to plants and show evidence of careful study and special knowledge of nomenclatural matters and bibliographical sources. With the exception of the paper on *Trichobaris* LeConte discussed below, his weevil publications were relatively brief and not revisional in nature. He described 14 species as new of which 11 are presently considered valid. No genus-level taxa were described by Barber.

Jens Prena contributed the following comments on Barber’s work on the Baridinae: “Barber ‘touched’ the baridine weevils in three papers. His 1935 study on *Trichobaris* was one of the first reviews of a genus in this subfamily at all, and is written in a surprisingly modern style. *Trichobaris* contains very similar species which are not easy to identify, and Barber mastered this challenge by studying many (ca. 1500) specimens from a wide range of locations and by including character states of the male genitalia. The genus has not been studied again in this depth, and it remains to be seen if Barber’s results will hold. What we can say is that his key is very helpful for species identification and that this is quite noticeable in many collections, particularly when compared to closely related genera with more distinctive species such as *Lepidobaris* Champion and *Stictobaris* Ca-
Herbert S. Barber (continued)

References


Leng, C. W., and A. J. Mutchler. 1927. Supplement 1919 to the knowledge of the group by this unassuming man deserve to be noted as a part of our history.


Herbert S. Barber’s Publications on Curculionidae - An Annotated List

Barber, H. S. 1912. Note on the avocado weevil (*Heilipus lauri* Boheman). Proceedings of the Entomological Society of Washington 14: 181-183 + illus. [Description of damage to avocado plants based on rearings in a greenhouse in Washington, D.C.; brief taxonomic notes; photographs of adult and pupa. In unitled discussion following Barber’s paper (p. 183) E. A. Schwarz summarized knowledge of hosts of *Heilipus.*]


Barber, H. S. 1917. Notes and descriptions of some orchid weevils. Proceedings of the Entomological Society of America 19: 12-22 + illus. [Describes new species of *Acythopeus* and *Eucactophagus*; provides extensive biological and taxonomic notes on these and other species of *Cholus* and *Eucactophagus* associated with orchids; photographs of adults of new species and *Cholus forbesi* and *Cholus cattleyae.* See also: Jens Prena’s comments above on Barber’s concept of *Acythopeus.*]

Barber, H. S. 1919. Avocado seed weevils. Proceedings of the Entomological Society of America 21: 53-60 + illus. [Reviews the biology and taxonomy of weevils and other insects attacking avocado seeds, including two species each of *Heilipus* (describes *Heilipus pittieri* as new) and *Conotrachelus* (describes *Conotrachelus perseae* as new); photographs of *Heilipus lauri* Boheman and *Heilipus pittieri.*]


Barber, H. S. 1923. Two new *Conotrachelus* from tropical fruits. (Coleoptera, Curculionidae). Proceedings of the Entomological Society of Washington 25: 182-185. [Describes as new *Conotrachelus aguacatae* from Mexico and *Conotrachelus sapotae* from Cuba, both being reared from avocado fruit; male median lobe of *C. aguacatae* illustrated and compared with that of *Conotrachelus serpentinus* Boheman and *Conotrachelus perseae* Barber, probably the first time this structure has been used to distinguish species of the genus.]

Barber, H. S. 1924. The generic names of the clover and alfalfa weevils *Hypera* and *Phytonomus. Proceedings of
Herbert S. Barber (end)

the Entomological Society of Washington 26: 216. [Argues for retention of both Hypera and Phytonomus as valid genus-level names.]


Barber, H. S. 1927. A supposedly new baridiid weevil from Peruvian sugarcane. Proceedings of the Entomological Society of Washington 29: 149-150 + illus. [See Jens Prena’s comments on this paper above.]

Barber, H. S. 1928. Thomas Say’s unrecorded journey in Mexico. Entomological News 39: 15-20. [Discusses the route Say took in Mexico in 1828 as a basis for determining where he collected the insects, including some weevils, he described. Concludes that the probable route was “along the old road between Vera Cruz, Jalapa, Mexico City and Tacuba.”]

Barber, H. S. 1935. The tobacco and solanum weevils of the genus Trichobaris. Miscellaneous Publication No. 226, United States Department of Agriculture, 28 pp. [Revision of the genus with key for identification, extensive biological notes, photographs, distribution map, and illustrations of male median lobes. See Jens Prena’s comments’s above.]

Barber, H. S., and J. C. Bridwell. 1940. Dejean Catalogue names (Coleoptera). Bulletin of the Brooklyn Entomological Society 35: 1-12. [Although this article does not specifically treat weevils, the description of the bibliographical and nomenclatural importance of the catalogue is also pertinent to the determination of the status of curculionid names.]


Weevil Symposium Review - ESA 2007 San Diego

By Adriana E. Marvaldi (CONICET, Mendoza, Argentina: marvaldi@lab.cricyt.edu.ar)

Weevils had “their” first Symposium at the Annual Meeting of the Entomological Society of America (ESA), in San Diego on December 10, 2007. As reported in previous issues of CURCULIO, the initiative was suggested during the informal weevil meeting in 2006, and was successfully proposed and organized by Nico Franz and Robert Hamilton. In accord with the “Making Connections” theme of the ESA 2007 Meeting, the Weevil Symposium title was “New Minds for Weevil Systematics - Building Bridges Between Generations and Regions.” It was intended to make connections among predominantly younger weevil systematists with more established workers, spanning a variety of weevil themes, as well as geographic connections from North-, Central-, and South America, and the South Pacific. The two speakers from South America were invited thanks to a Program Enhancement Fund (PEF) for the Annual Meeting. The Symposium occupied the Monday afternoon session (1:30-5:30 p.m.). The introductory remarks by Nico Franz were succeeded by eleven presentations that made connections from “sea level to mountain peaks”, from population to family levels, from “larvae to nucleotides”, and so on. A synopsis of the topics of each presentation is provided here.

1. Biodiversity of Costa Rican leaf litter weevils from sea level to mountain peak. Robert S. Anderson (Canada: randerson@mus-nature.ca) reported results of project LLAMA (leaf litter arthropods of Mesoamerica), with many weevils sampled in Costa Rica in both lowland and highland areas. The leaf litter of the forest floor shows an amazing diversity of weevils, a great proportion of them new to science, whereas the highland areas show high levels of endemism and are important to set conservation priorities.

2. Classical taxonomy and expert information systems: systematics in the modern world. Muhammad Haseeb (USA: muhammad.haseeb@famu.edu, USA) and Charles O’Brien (USA: cobrien6@cox.net) provided an overview of the operation and potential offered by macromedia keys compared with classical taxonomic approaches (dichotomous keys) and their expected impacts on modern systematics. The shortage of taxonomists around the world has been recognized as a major setback to biodiversity conservation efforts. The computer based decision-support keys, offer a unique solution by capturing knowledge held by the diminishing number of taxonomists or in complex print based taxonomic keys, together with other information available in literature, in a simple, and easy to use macromedia format. These modern keys utilize high definit-
2007 Symposium Review (continued)

tion images and can be deployed on the Internet allowing global access.

3. Phylogeny of Curculionoidea: from larvae to nucleotides. Adriana E. Marvaldi (Argentina: marvaldi@lab.cricyt.edu.ar) presented phylogenetic studies involving the weevils, spanning different taxonomic levels and based on evidence from morphology and rDNA sequences. An updated phylogenetic hypothesis for Curculionoidea, at family and subfamily levels, based on 130 morphological characters was shown. The cladogram recovers seven major lineages or families and the relationships among them, with the nodes defined by both larval and adult synapomorphies. This study sets the stage for ongoing and further exploration of subfamily relationships. Then, a cladogram at genus level for the belid subfamily Oxyccoryninae was presented, and again, both larvae and adults contribute synapomorphies. Interestingly, the curculionoid phylogeny recovered from analysis of structure-aligned 18S and 28S segments, which is independent of morphological data, is in agreement with recent hypotheses based on morphological evidence, particularly with respect to families. The value of incorporating secondary DNA structure information in the process of alignment is highlighted. Results from these studies vindicate two data sets as good phylogenetic markers: larval morphology and nuclear rDNA sequences.

4. Population subdivision of a fruit pest. Samuel N. Crane (USA: scrane@amnh.org) investigated population subdivision within Conotrachelus nenuphar using a variety of diversity indices and other population genetic approaches. Twenty unique COI haplotypes span the northern and southern extremes of the species eastern limit. Diversity indices revealed that most genetic variation is found between groups. Haplotype diversity was high compared to nucleotide diversity, evidencing recent population expansion. The resulting haplotype network showed significant structuring at the level of populations and regions. The southern and northern haplotype networks were distinct, but other geographic correlates were inconclusive and underscore the need to expand the geographic and genetic sampling.

5. Current advances in the phylogenetic reconstruction of the Anthribidae. José R. Meruades (Brazil: jrmuruades@uol.com.br) presented the first hypothesis of phylogenetic relationships among genera of Anthribinae, together with a revision, cladistic analysis and biogeography of the tribe Ptychoderini. The cladogram shows two main groups, one Afrotropical and Oriental, and the other Neotropical.

6. Ecological and evolutionary radiation of weevils (Curculionoidea). Duane McKenna (USA: dmckenna@oeb.harvard.edu), Andrea Sequeira, Adriana E. Marvaldi, and Brian Farrell reported timing and patterns of weevil diversification in deep time, reconstructed from an extensively sampled molecular phylogeny, with age constraints from the fossil record.

7. Systematics of Trachyploeoiminus. Pamela J. Horsley (Canada: pamela.horsley@mail.mcgill.ca) presented results of an ongoing systematic study on Central American Trachyploeoiminus (Entiminae), with a preliminary cladistic analysis. The group is very diverse, and like other leaf-litter weevils, it contains a great proportion of new species to be described.

8. Reproductive trade-offs in a specialized cyclanth weevil pollination system (Coleoptera: Curculionidae). Nico M. Franz (USA: franz@uprm.edu) investigated the interactions of a specialized plant/pollinator system involving a Cyclanthaceae and a derelomine flower weevil. The plant inflorescences exhibit several cantharophilous characters and the weevil pollinators use the inflorescences for feeding, mating, and oviposition. The larvae develop either in the detaching staminate flowers or in the rotting infructescences. The rate of infructescence abortion was high and caused by low levels of pollination. In the long term, the benefits of maintaining low levels of pollination may shift away from the weevils and towards the plants via an increase in the size of the pollinator population.

9. Phylogeny of Madopeterini. Steven Ray Davis (USA: sterv@ku.edu) reported the first phylogeny for the subfamily Baridinae, with an emphasis on the (paraphyletic) tribe Madopeterini. A variety of informative characters in the baridines are documented and their evolution being clarified. These include prosternal horns, sclerolepidia, striulatory and wing-locking mechanisms.

10. Systematics of Asytesta and allied crowned weevil genera from the Indo-Australian region. Gregory P. Setliff (USA: setl0003@umn.edu) presented a systematic review of the “crowned weevil genera” including the genus Asytesta (Cryptorhynchinae). The group is comprised of six genera occurring from the Philippines to the Solomon Islands, with numerous new species to be described from New Guinea and adjacent islands.

11. Advances in the systematics of Xyleborina. Jiri Hulcr (USA: jirihulcr@tamu.edu) reported recent contributions made by him and his team led by A. Cognato on the diverse and economically important Xyleborina (Scolytinae). These include emulating the Xyleborina part of the Wood & Bright (1992) Catalog into an Internet database, a key to world genera (http://xyleborini.tamu.edu), a morphology based cladistic analysis to genera, a robust molecular phylogeny based on five genes and showing conservative ecological and morphological features (i.e., type of mycangia), and the discovery of the mycophagism as life strategy.

This wonderful afternoon concluded with a discussion and mixer following the Symposium. On Tuesday the “weeviling” continued at the informal weevil meeting led by Charlie O’Brien, as has been the norm over many years at ESA.
Book Review - Weevils of Canada & Alaska: Entiminae

Donald E. Bright & Patrice Bouchard

By Robert Anderson (Canada: randerson@mus-nature.ca)


This is part 25 in the excellent series of Handbooks on the insect and arachnid fauna of Canada and Alaska. It is the second volume to deal with the weevils, one of the most diverse groups of beetles. The previous volume by Don Bright (= Part 21, Coleoptera, Curculionoidea, excluding Scolytidae and Curculionidae) treated the weevils in the families Anthribidae, Nemonychidae, Brentidae, Apionidae, Rhynchitidae, Attelabidae, Ithyceridae, and Platypodidae. The book is in English but French versions of all identification keys are provided.

The broadnosed weevils of the subfamily Entiminae, as they are commonly called, are one of the more diverse and economically important groups of weevils in Canada and Alaska. Many species have been introduced into Canada from Europe and many species are frequently encountered in gardens or in homes and can be considered as pests. In total, 49 genera and 123 species are treated in this publication. Not all of the included species are known to occur in Canada or Alaska, but based on their distributions, might be present, just not yet recorded. The book is arranged with a short introduction, including general biology, anatomy and classification of weevils, followed by a key to the subfamilies of the Curculionidae (a very important contribution in itself), followed by the detailed treatment of the Entiminae.

The treatment of the broadnosed weevils starts with a very good key to the genera. Then begins a systematic treatment of each genus including a detailed description, distribution and comments (mainly natural history) sections. For each genus, there is also a key to the species, or if there is only one species of that genus in Canada, a treatment of the species. Species treatments include a description, statement of distribution and comments. All distributions are mapped and habitus illustrations and wonderful, coloured habitus photographs are provided for many of the species. These photographs and illustrations facilitate use of the keys and in many instances are sufficient in themselves for accurate identifications. The book concludes with an excellent listing of references on these weevils.

The book is a comprehensive treatment of these weevils in Canada and Alaska. It certainly provides an excellent means for their identification and is an excellent resource for information about their biology and habits. As many of the included species also occur in the northern United States, the book should have international appeal as a resource for weevil identification there as well. It should be added to the excellent listing of already published titles in this series and deserves a place on the bookshelf of all entomologists, whether one studies weevils or just has a passing interest.

Weevils of Canada and Alaska - Volume 2 is sold on-line by NRC Press for CAN/US $59.95. For more information on purchasing please refer to the website: http://pubs.nrc-cnrc.gc.ca/eng/books/books/9780660194004.html

The Bulletin Board

News About Weevils

Henry Hespenheide (USA: hahiii@ucla.edu) points to an article entitled “Brazilian Beetles Hold Key to Faster Computers”, where the configuration of the metallic scales of an entimine weevil is said to hold clues for making optical computer chips; see http://www.wired.com/science/discoveries/news/2008/05/photonic_beetle

Robert Jones (Mexico: rjones@uaq.mx) submits the following tribute to Raúl Muñiz Vélez. “Early this year, the Maestro Raúl Muñiz Vélez, passed away in Mexico City. He was a well known teacher of entomology and mentor for students interested in the study of insects. For many years, he was one of the principal taxonomists of Curculionoidea in Mexico working first with the Dirección General de Defensa Agrícola and later with the Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarios in Mexico City; as well as teaching for many years at the Escuela Nacional de Ciencias Biológicas. He was an excellent artist and musician and will be missed by all who knew him. The following are some of the publications...”

(continued page 12)
of Maestro Muñiz and a sample of his art work.


Analia Lanteri (Argentina: alanteri@fcnym.unlp.edu.ar) responds to an article entitled “The Colombian Potato Whitefringed Weevil” (Curculio 55: 12-13; 2007), as follows.

“I have read in Curculio volume 55 a note on the life history of the ‘Tiroteador de la Papa’ (Naupactus sp., Curculionidae). Based on the published photographs and those sent me by the author, Jenifer Garza, it is clear that the species does not belong to Naupactus, but to one species of Amphideritus Schoenherr 1840. This genus ranges from Colombia to northern Chile, from about 500 to 4300 meters over sea level, and due to this distribution some of its seven species are frequently associated to potatoes cultures, as are those of the related genus Amitrus Schoenherr 1840. The genus Amphideritus is currently under taxonomic revision by my graduate student, Lic. María Guadalupe del Río, as part of her Ph.D. thesis at the University of La Plata, Argentina. Whitefringed weevils correspond to the Naupactus leucoloma species group, revised in 1995 by Lanteri and Marvaldi (Coleopterists Bulletin 49: 206-228). Its species occur in prairies of southern South America, and some of them have been introduced with different cultivars in North America, Australia, New Zealand and South Africa. A molecular phylogeographic study of Naupactus leucoloma Boheman, N. minor (Buchanan) and N. peregrines (Buchanan) in South America is currently undertaken by my graduate student Lic. Noelia Guzmán, as of her Ph.D. thesis at the University of Buenos Aires, Argentina. It is important that specialists working on particular biological aspects of weevil species are in touch with taxonomists working on these groups, in order to provide accurate information and avoid confusion on the geographical distribution and main biological features of these taxa. My research team at the Museo de La Plata, Argentina, is willing to provide help with the taxonomic identification of Naupactini species to those colleagues that need this information.

Charles O’Brien (USA: cobrien6@cox.net) sends the following message to Curculio readers. “I want to thank all of you for your messages and kind thoughts for my 75th birthday in late March. I responded to a couple of these, but lost my hard drive with all messages, addresses and data files a few days later. The hard drive appears to be unrecoverable but I am still trying. I would greatly appreciate it if anyone who may be able to help me would contact me with their addresses and any files that we were working on together. My new computer is being backed up with an external hard drive, so this will not happen again.

Things continue to get done but more slowly than new projects begin. I am collecting frequently in southern Arizona and am working on several papers, at least four in their final stages: an annotated checklist of weevils from Dominica, a World revision of the subfamilies of the tribe Curculionini, a new species of United States Conotrachelus, and a new species of Cholus from Martinique. A one-week trip in March to the Arizona and California sand dunes produced more than 1200 specimens of Trigonoscuta, including seven described species and six new species, and 200+ specimens of seven species of Ophryastes.

Lois and I will be off for two weeks in late July to Guatemala for collecting under the guidance of José Monzón. It will be good to get into the Neotropics once again and at the right season.

I am working actively on several other studies, including revisions of Rhopalotria, Lissorhoptrus, the New World genera of Stenopelmini, and have others in the works. Please do consider my collection for a loan when working on almost any weevil group because my collection is worldwide in scope. Some time ago I received a request for identification of a beautiful weevil taken on windowsills in Phoenix, Arizona, and to my surprise I identified it as the Palearctic Hyperinae, Coniatus tamarisci (Fabricius), not previously known from the United States.

William Phillips (USA: wildbill288@yahoo.com) has acquired some lecture papers of the following specialists: William D. Pierce, B. H. Ransom, and F. C. Bishopp (dated November 18 to December 16, 1918). The titles include “Proceeding of the class formed to study the entomology of disease, hygiene, and sanitations”. They are available upon request.
Recent Publications on Curculionoidea


Germann, Ch. 2006c. *Otiorhynchus smreczynskii* Cmoluch, 1968 - nun auch in der Schweiz (Coleoptera, Curculioni-
Recent Publications (continued)


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Recent Publications (continued)


Recent Publications (end)


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See page 11 of this volume.