

Gavin John Svenson- *Curriculum Vitae*

Research Associate

Department of Biology
Museum of Southwestern Biology
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EDUCATION

Ph.D. Phylogenetics and Systematics- August 2007

Brigham Young University, Provo, Utah. Dissertation: *The Origins, Evolution, and Phylogeny of the Praying Mantises (Dictyoptera: Mantodea)*; Committee Chair: Dr. M.F. Whiting.

B.S. with Distinction in Research, Entomology- May 2002

Cornell University, Ithaca, New York.

APPOINTMENTS

2009-current: Adjunct Assistant Professor, University of New Mexico, Albuquerque, NM

2008-current: Post-doctoral Research Associate / Assistant Curator, New York State Museum, NY

2009 Visiting Associate Professor, Muséum National d'Histoire Naturelle, Paris

2007-2008 Lecturer, Brigham Young University, Provo, UT

REFEREES

Jason R. Cryan, Ph.D.- Post-Doctoral Advisor

New York State Museum, Laboratory for Conservation and Evolutionary Genetics, CEC 3140,
Albany, New York, 12230, USA. Email- jcryan@mail.nysed.gov Office- (518) 486-2008

Michael F. Whiting, Ph.D.- Graduate Committee Chairperson

Brigham Young University, Department of Biology, 401 WIDB, Provo, Utah, 84602, USA.
Email- michael_whiting@byu.edu Office- (801) 422-4735

David D. Yager, Ph.D.- Research Collaborator

University of Maryland, Department of Psychology, 2123G BPS, College Park, Maryland, 20742,
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David Grimaldi, Ph.D.- Research Collaborator

American Museum of Natural History, Department of Entomology,
Email- grimaldi@amnh.org

Kelly Miller, Ph.D.- Research Collaborator

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NM 87131, USA. Email- kbmiller@unm.edu Office- (505) 277-8168.

Marc A. Branham, Ph.D.- Research Collaborator

University of Florida, Department of Entomology & Nematology, P.O. Box 110620, Gainesville, FL,
32611, USA. Email- mabranham@ifas.ufl.edu Office- (352) 392-1901.

GRANTS

- 2010** US National Science Foundation, Division of Environmental Biology: “REVSYS: Multilevel Revision within the Praying Mantises (Insecta, Dictyoptera, Mantodea)”.
Principle Investigator- Gavin Svenson, CoPI- Kelly Miller. Award amount: \$603,742
- 2008** Research and Collections Grant, New York State Museum, Amount: \$11,500
- 2008** Entomological Society of America, Internal Congress of Entomology Travel Grant, Amount: \$2,000
- 2006** Graduate Student Association Travel Grant, Amount: \$500
- 2006** Brigham Young University Mentored Learning Grant, Amount: \$4,000
- 2005** Brigham Young University Mentored Learning Grant, Amount: \$4,000
- 2004** Brigham Young University Mentored Learning Grant, Amount: \$4,000
- 2004** Booth Scholarship for Entomological Research, BYU, Amount: \$500
- 2003** Tipton Family Scholarship for Entomological Research, BYU, Amount: \$500
- 2003** Hennig Society Travel Award, Amount: \$500

PROFESSIONAL CONTRIBUTION

- Organizer for ESA Program Symposium during the 2010 Entomological Society of America Annual Meeting. Title: Praying Mantises (Mantodea): Diversity of Form, Function, and Biology
- Co-organizer for symposium during the 2008 International Congress of Entomology Symposium Title: 12.6 Behaviour and Evolution of Mantodea, Section- Behaviour and Neurobiology
- Scientific Reviewer for: Systematic Entomology, Systematic Biology, Molecular Phylogenetics and Evolution, Cladistics, ZooTaxa, Annales de la Société Entomologique de France, Biota Colombiana
- Scientific Consultant, Natural History Unit, National Geographic Television and Film
- Member- Entomological Society of America, Orthopterist’s Society
- Contributor to the New York State Museum Teacher’s Workshop on Evolution

TEACHING EXPERIENCE

Graduate Courses:

Course Instructor, **Phylogenetic Systematics**: Inbio640 at Brigham Young University, Fall 2007; 4 credit lecture/computational lab course.

Course Instructor, **Advanced Insect Structure and Function**: for Inbio559R at Brigham Young University, Winter 2005; 4 credit lecture/lab course.

Course Teaching Assistant, **Phylogenetic Systematics**: for Inbio640 at Brigham Young University, Fall 2005; 4 credit lecture/computational lab course.

Undergraduate Courses:

Course Teaching Assistant, **Insect Morphology and Systematics**: for Inbio441 at Brigham Young University, Fall 2006; 4 credit lecture/lab course.

Course Teaching Assistant, **Field Entomology Course**: Brigham Young University, Summer 2005; 4 credits.

Course Teaching Assistant, **Aquatic Macroinvertebrates**: Cornell University, Fall 2001; 4 credit lecture/lab course.

MENTORING EXPERIENCE

Through my previous role as a graduate student and my current role as a post-doctoral researcher, I have interacted with high-school, undergraduate, and graduate students alike as a technical trainer, a research mentor, and a formal course instructor. Current and past experiences have prepared me to proficiently direct, manage, and teach students and researchers in both formal and informal settings.

2009-current Adam Bell, New York State Museum, University at Albany, NY.

Currently training Adam in molecular and morphological phylogenetics, DNA sequencing, manuscript preparation, and research presentation.

2008 Katayo Sagata, Wildlife Conservation Society, Goroka, Papua New Guinea.

Assisted to obtain funding through the Society for Systematic Biologist's "Scholarships and travel awards for scientists from developing countries to obtain systematics training."

2006-2008 Dana Jensen, Brigham Young University, Utah.

Trained Dana in molecular lab work, phylogenetic theory and analysis, and manuscript preparation.

2004 Damodara Rao Gullipalli, University of Hyderabad, Hyderabad, India.

Assisted to obtain funding through the Society for Systematic Biologist's 'Scholarships and travel awards for scientists from developing countries to obtain systematics training'.

Trained Damodara in molecular based systematics and phylogenetic reconstruction.

RESEARCH SKILLS

I have received formal training and experience in the following areas of entomological research.

- **Museum Collection Techniques**
 - *Traditional Taxonomic Collections-*
 - Insect sorting, mounting/preservation, labeling and identification
 - Collection curation and specimen integration/databasing with Specify
 - Photo imaging
 - *Genetic Tissue Based Collections-*
 - Specimen preservation and long-term cryogenic-storage.
 - Specimen database & voucher management, organization of down stream product (DNA template, primary and secondary vouchers).
- **Molecular Laboratory Techniques**
 - *DNA Extraction-*
 - Qiagen DNeasy protocol for animal tissues
 - *Gene Amplification-*
 - Standard PCR protocol, trouble-shooting PCR (touch-up, -down), gradient PCR, nested primer PCR, primer design, and gel extraction, gel electrophoresis
 - *Cloning-*
 - PCR based direct cloning to sort and establish orthologous and paralogous gene copies and optimize new genes for phylogenetics
 - *Sequencing-*
 - Montage PCR₉₆ cleanup, cycle sequencing with ABI Prism BigDye version 3 dye terminator chemistry, column purification with Sephadex™ cleanup
- **Phylogenetic Analysis Techniques**
 - *DNA Sequence Handling-*
 - Proficient in sequence verification/correction using SEQUENCHER and ABI software.
 - Software- McClade v.4.06, Mesquite OSX, MEGA, PAUPb10, etc...
 - *DNA Alignment-*
 - Software- ClustalX&W, MALIGN, POY, MUSCLE, MAFFT, T-Coffee, etc...
 - Proficient in sequence alignment for length variable genes
 - *Phylogenetic Tree Building-*
 - Proficient in phylogenetic reconstruction using parsimony, maximum likelihood,

- Bayesian, and distance methods
- Software- PAUPb10, TREEFINDER, TNT, MrBayes, POY, GARLI, etc...
- *Comparative Methods and Dating-*
 - Proficient in downstream analysis for divergence time estimation, population analysis, biogeographic patterns, character evolution, and ancestral state reconstruction using a wide array of software
- *Super-Computation-*
 - Experience using large-scale super-computers and clusters for data management, software usage, and parallel processing
- **Fieldwork Training**
 - *Expedition Planning-*
 - Organization of federal, state, and parks level permitting
 - Logistical organization for expeditions including in-country transportation, lodging, guide services, and collaborator scheduling
 - *Collecting Techniques-* for overview see- www.mantodearesearch.com
 - Techniques: mercury vapor lamping, black lighting, malaise trap, pitfall traps, flight intercept traps, aerial netting, aquatic netting, beating vegetation, net sweeping, manual canopy access (single rope climbing), and remote canopy trapping (management of canopy samplers)

FIELDWORK

Field expeditions focused on entomological research that I participated, planned, and/or executed:

2010 Nicaragua	2005 Peru (Tambopata)
2010 Dominican Republic	2004 India (Assam & Meghalaya)
2009 Bolivia	2004 India (Western Ghats)
2009 Cameroon	2004 Bolivia
2009 Borneo (Sarawak)	2003 Argentina/Chile
2008 Madagascar	2003 Peru (Tambopata)
2008 South Africa	2003 Borneo (Sabah)
2008 Vanuatu (Efaté & Espiritu Santo)	2003 West Malaysia
2008 Papua New Guinea (New Britain & Ireland)	2003 India (Andhra Pradesh & Western Ghats)
2006 Borneo (Sarawak)	2002 United States (Pacific Northwest)
2006 South Africa (Cape Province)	2002 Australia (Tasmania and N.T.)
2006 Zambia (Copperbelt District)	2002 United States (southeastern)
2005 South Africa (Kruger National Park)	2001 Australia (northern Queensland, N.T.)
2005 India (Western Ghats)	2001 Papua New Guinea (Highlands)

INVITED LECTURES

- 2010: **New York State Museum**, Teacher's Workshop on Evolution
- 2010: **Northeast Symposium on Evolutionary Divergence Time**, Rutgers University
- 2009: **Siena College**, Department of Biology, Seminar Speaker.
- 2009: **Cornell University**, Department of Entomology, Seminar Speaker.
- 2009: **New York State Museum**, Teacher's Workshop on Evolution
- 2008: **International Congress of Entomology**, Durban, South Africa Behaviour and Evolution of Mantodea.
- 2006: **Utah Valley State College (Provo, UT)**, Department of Biology, Seminar Speaker.
- 2004: **Entomological Society of America**, Collecting Abroad: Laws, Permits, and Experienced-based Recommendations
- 2004: **Entomological Society of America**, Orthopterists' Society Symposium, Invited Speaker.
- 2004: **University of Hyderabad (Hyderabad, India)**, Dept. of Animal Sciences, Invited Speaker.
- 2004: **National Centre for Cell Science (Pune, India)**, Symposium for Phylogenetic Research.
- 2003: **The Phylogenetic Relationships within the Insect Orders (Dresden, Germany)**, Invited Speaker.
- 2002: **Cornell University**, Department of Entomology, Seminar Speaker.

CONTRIBUTED PAPERS AT SCIENTIFIC MEETINGS

- March 2010: F.R. Prete, S. Dominguez, J.L. Komito, R.J. Theis, L.E. Hurd, G.J. Svenson.** Prey Recognition by Four Species of Praying Mantis: Does Size Matter? **17th Annual Animal Behavior Conference**, Center for the Integrative Study of Animal Behavior (CISAB) at Indiana University.
- Dec. 2009: Svenson, G.J.** A new dawn for praying mantis systematics (Dictyoptera: Mantodea): reconciling morphology and molecules. Presentation #0740 of the **Entomological Society of America 2009 Annual Meeting** (Indianapolis, IN).
- Sept. 2009: Wieland, F., K.-D. Klass, and G.J. Svenson.** The basal branchings of the mantodean tree: How much of a cockroach is in *Mantoida*, *Chaeteessa* and *Metallyticus*?. Invited presentation at the 4th Dresden Meeting on Insect Phylogeny (Germany).
- Dec. 2007: Svenson, G.J. and M.F. Whiting.** Tracing the Origins of Praying Mantises (Dictyoptera: Mantodea): emergence of modern Gondwanan mantises and their subsequent ecomorphic convergences. Presentation #0279 of the **Entomological Society of America 2007 Annual Meeting** (San Diego, CA).
- Dec. 2007: Jensen, D., G.J. Svenson, H. Song, and M.F. Whiting.** The phylogeny, biogeography, and evolution of male genitalia within the praying mantis genus *Tenodera* (Mantodea: Mantidae). Presentation #0257 of the **Entomological Society of America 2007 Annual Meeting** (San Diego, CA).
- Dec. 2006: Svenson, G.J. and M.F. Whiting.** Phylogeography and Convergent Ecomorphic Evolution of the Praying Mantises (Dictyoptera, Mantodea). Presentation #0239 of the **Entomological Society of America 2006 Annual Meeting** (Indianapolis, IN).
- Dec. 2006: Jensen, D., G.J. Svenson, and M.F. Whiting.** Phylogeny and biogeography of the Chinese mantis genus *Tenodera* (Mantodea: Mantidae). Presentation #D0010 of the **Entomological Society of America 2006 Annual Meeting** (Indianapolis, IN).
- June 2006: Svenson, G.J. and M.F. Whiting.** Phylogeography and Convergent Ecomorphic Evolution of the Praying Mantises (Dictyoptera, Mantodea). Presented in “Higher-Level Systematics of Arthropods” at **2006 Evolution** (Stony Brook, NY).
- Dec. 2005: Svenson, G.J. and M.F. Whiting.** Phylogeny, biogeography and trends of ecomorph evolution within Mantodea: The emergence of convergence. Presentation #0229 of the **Entomological Society of America 2005 Annual Meeting** (Ft. Lauderdale, FL).
- June 2005: Svenson, G.J. and M.F. Whiting.** Phylogeny, biogeography and trends of ecomorph evolution within Mantodea: The emergence of convergence. Presented in “Higher-Level Systematics of Arthropods” at **2005 Evolution** (Fairbanks, AL).
- June 2004: Svenson, G.J. and M.F. Whiting.** Phylogeny of Mantodea: evolutionary trends in mantids. Presented in “Higher-Level Systematics of Arthropods” at **2004 Evolution** (Ft. Collins, CO).
- Nov. 2003: Svenson, G.J. and M.F. Whiting.** The phylogeny of Mantodea based on molecular evidence: evolution of a charismatic predator. Presentation #0363 of the **Entomological Society of America 2003 Annual Meeting** (Cincinnati, OH).
- July 2003: Svenson, G.J. and M.F. Whiting.** The phylogeny of Mantodea based on molecular evidence: evolution of a charismatic predator. Presented at the **2003 Annual Meeting of the Hennig Society** (New York, NY).
- Nov. 2002: Svenson, G.J. and M.F. Whiting.** Molecular Phylogeny of Mantodea: Preliminary evidence. Presentation #0400 of the **Entomological Society of America 2002 Annual Meeting** (FL).

PUBLICATIONS

A. Refereed

- Svenson, G.J.**, and R. Roy. *In Press*. Taxonomic treatment of the endemic Malagasy praying mantis genus *Hyalomantis* with the description of three new species (Mantodea, Iridopterygidae, Tropidomantinae). *Zootaxa*
- Roy, R., and **G.J. Svenson**. *Submitted*. Revision of *Platycalymma* Westwood, 1889 and the synonymy of *Ichromantis* Paulian, 1957 (Mantodea, Iridopterygidae, Tropidomantinae). *Bulletin de la Société entomologique de France*
- Prete, F.R., J.L. Komito, S. Domínguez, **G.J. Svenson**, L.Y. López, A. Guillen, N. Bogdanivich. *In Review*. Prey Recognition and Body Size in Three Species of Praying Mantis. *Journal of Comparative Physiology A*.
- Cryan, J.R., and **G.J. Svenson**. 2010. Family-Level Relationships of the Spittlebugs and Froghoppers (Hemiptera: Cicadomorpha: Cercopoidea). *Systematic Entomology* 35: 393-415.
- Gullipalli, D., Arif, A., Aparoy, P., **Svenson, G.J.**, Whiting, M.F, Reddanna, P., and A. Dutta-Gupta. 2010. Identification of a Developmentally and Hormonally Regulated Delta-Class Insect Glutathione S-transferase. *Comparative Biochemistry and Physiology, Part B* 156: 33-39.
- Jensen, D.J., **G.J. Svenson**, H. Song, and M.F. Whiting. 2009. The phylogeny and evolution of the male genitalia within the praying mantis genus *Tenodera* (Dictyoptera, Mantodea). *Invertebrate Systematics* 23: 409-421.
- Svenson, G.J.**, and M.F. Whiting. 2009. Reconstructing the Origins of Praying Mantises (Dictyoptera, Mantodea): the roles of Gondwanan vicariance and morphological convergence. *Cladistics* 25: 468-514.
- Yager, D.D., and **G.J. Svenson**. 2008. Patterns of Praying Mantis Auditory System Evolution Based on Morphological, Molecular, Neurophysiological, and Behavioral Data. *Biological Journal of the Linnaean Society* 94: 541-568.
- Svenson, G.J.**, and M.A. Branham. 2007. PHOTININI LeConte, 1881 (Insecta, Coleoptera) and PHOTININAE Giglio-Tos, 1919 (Insecta, Mantodea): proposed resolution of homonymy between family-group names. *Bulletin of Zoological Nomenclature* 64 (4): 243-251.
- Roy, R., and **G.J. Svenson**. 2007. Revision of the genus *Ceratomantis* Wood-Mason (Dictyoptera, Mantodea). *Bulletin de la Société entomologique de France* 112 (4): 433-444.
- Svenson, G.J.**, and M.F. Whiting. 2004. Phylogeny of Mantodea based on molecular data: evolution of a charismatic predator. *Systematic Entomology* 29: 359-370.
- Dittmar K., M. L. Porter, L. Price, **G. Svenson**, and M. F. Whiting. 2004. Invertebrates of caves of peninsular Malaysia. *Malaysian Nature Journal* 57(2): 221-233.
- Svenson, G.J.**, and M.F. Whiting. In Klass, K.-D. (Hrsg.). 2003. Phylogeny of Mantodea based on molecular data: evolution of a charismatic predator. Proceedings of the 1st Dresden meeting on insect phylogeny: "Phylogenetic Relationships within the Insect Orders" (Dresden, September 19-21, 2004a); *Entomol. Nacher.*, 61(2): 138; Dresden.

B. Dissertation

- Svenson, G.J. 2007. Thesis (Ph.D.). Department of Biology, Brigham Young University. *The Origins, Evolution, and Phylogeny of the Praying Mantises (Dictyoptera: Mantodea)*. 358 p.

C. Manuscripts In Preparation

- Svenson, G.J. *In prep*. Comprehensive revision and phylogeny of the South American bark mantis genus *Liturgousa* (Mantodea, Liturgousidae). (Planned submission to Systematic Entomology).

Svenson, G.J. *In prep.* Dispersal and Vicariance in Malagasy Mantodea (Dictyoptera): evidence for a complex Gondwanan history. (Planned submission to Journal of Biogeography).

Cameron, S.L. and G.J. Svenson. *In prep.* Resolving deep divergences within praying mantises (Dictyoptera, Mantodea) using mitochondrial genomes. (Planned submission to Molecular Phylogenetics and Evolution).

Wieland, F., K-D. Klass, and G.J. Svenson. *In prep.* The basal branchings of the mantodean tree: How much of a cockroach is in *Mantoida*, *Chaeteessa* and *Metallyticus*?. (Planned submission to Arthropod Systematics & Phylogeny).