AINSLEY SEAGO
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RESEARCH INTERESTS

Molecular phylogenetics and evolution of beetles; systematics of southern hemisphere Staphylinoidea; arthropod biomechanics and the evolution of structural colours in insects.

EDUCATION

Ph.D. 2003-2008
Insect Biology, Department of Environmental Science, Policy and Management, **University of California, Berkeley,** CA.
Advisor: Dr. Kipling Will
Dissertation topic: Systematics of the round fungus beetles (Coleoptera: Leiodidae), with a special focus on the austral tribe Agyrtodini

B. Sci. 1999-2003
Entomology, *Magna cum laude* with distinction in research, **Cornell University,** Ithaca, NY.
Advisor: Dr. Quentin Wheeler
Honours thesis: Morphological Study of *Chiliopelates crenulatus* (Hlisnikovsky) with implications for systematics of Agyrtodini.

PUBLICATIONS

16. Saranathan, V., **Seago A.E.,** Sandy, A., Narayanan, S., Osuji, C. O., Mochrie, S. G., Cao, H., Dufresne, E.R., and Prum, R. (2012). Insect scale photonic nanostructures span lyotropic phase space. *In review.*

15. **Seago, A. E.** and Saranathan, V. (2012) Photonic crystals in beetles. *In:* Nature's Nanostructures, A. Barnard and H. Guo, eds. Singapore: Pan Stanford. Pp. 313–325.

14. **Seago, A. E.,** Giorgi, J.A., Li, J. and Ślipiński, A. (2011). Phylogeny, classification and evolution of ladybird beetles (Coleoptera: Coccinellidae) based on simultaneous analysis of molecular and morphological data. Molecular Phylogenetics & Evolution. 60:137–151.

13. Lawrence, J. F., Slipinski, A., **Seago, A. E**., Thayer, M. K., Newton, A. F., and Marvaldi, A. E. (2011). Phylogeny of the Coleoptera based on morphological characters of adults and larvae. Annales Zoologici (Warszawa), 61 (1): 1–217.

12. Yeates, D., **Seago, A**., Nelson, L., Cameron, S. L., Joseph, L., and Trueman, J. W. (2011). Integrative taxonomy, or iterative taxonomy? Systematic Entomology 36 (2): 209-217.

11. **Seago, A. E.** and R. A. B. Leschen (2011). Revision, phylogeny, and biogeography of *Chelagyrtodes* Szymczakowski (Leiodidae: Camiarinae: Agyrtodini). Zootaxa 3090: 1–20.

10. Xu, M., **Seago, A. E.**, Sutherland, T. D., and Weisman, S.' (2010). Dual structural color mechanisms in a scarab beetle. Journal of Morphology, 271 (11): 1300–1305.

9. **Seago, A.** and Beutel, R. (2010). 11.15. Prostomidae G. G. Thomson, 1859. *In:* Coleoptera, Beetles. Volume 2: Morphology and Systematics, vol. IV of the Handbook of Zoology, N. P. Kristensen, R. G. Beutel, Eds. Berlin: Walter de Gruyter. Pp. 659-666.

8. **Seago, A. E.** and Newton, A. F. (2009). A new genus of leiodid beetle from Chile, with generic key and species checklist of described Neopelatopini (Coleoptera: Leiodidae: Camiarinae). Annales Zoologici (Warszawa), 59 (3): 297–304.

7. **Seago, A. E.** (2009). Revision of *Agyrtodes* Portevin (Coleoptera: Leiodidae). Coleopterists Bulletin 63 (1): 1–73.

6. **Seago, A., E.,** Brady, P., Vigneron, J., and T. Schultz, T. (2009). Gold bugs and beyond: a review of iridescence and structural colour mechanisms in beetles (Coleoptera). Journal of The Royal Society Interface, 6 (2): S165–S184.

5. Thomas, D. **Seago, A.** and Robacker, D. C. (2007). Reflections on golden scarabs. American Entomologist, 53 (4): 224–230.

4. **Seago, A. E. (**2005). Male description and generic review of *Agyrtolasia* Szymczakowski, with key to genera of Agyrtodini (Coleoptera: Leiodidae: Camiarinae: Agyrtodini). Zootaxa 1103: 1–15.

3. **Seago, A. E.** and Wheeler, Q. D. (2004). Two new species of *Aglyptinus* Cockerell with unusual sexually dimorphic antennae and diffraction gratings (Coleoptera: Leiodidae) The Coleopterists Bulletin, 58: 235–244.

2. **Seago, A.E.** and Lingafelter, S. W. (2003). Discovery of *Crepidodera bella* Parry (Coleoptera: Chrysomelidae: Alticini) in Maryland and redescription. Journal of the New York Entomological Society, 111(1): 51–56.

1. **Seago, A. E.** (2003). Morphological Study of *Chiliopelates crenulatus* (Hlisnikovsky) with implications for systematics of Agyrtodini. Honors thesis, Cornell University. 50pp.

WEB-BASED TOOLS

Beetles of the World. Lucid key to beetle families and subfamilies, adapted from Delta key by Lawrence et al. (2000).
http://anic.ento.csiro.au/insectfamilies/key_Coleoptera.aspx?OrderID=25407&PageID=identify&KeyID=0

Berkeley Bio-Keys. web-based interactive key to insect orders for K-12 students.
http://biokeys.berkeley.edu/

RESEARCH EXPERIENCE, TEACHING, AND MENTORING

April 2011- present: Postdoctoral researcher at CSIRO Ecosystem Sciences (formerly Entomology), supported by a grant from the Australian Biological Resources Study (ABRS). Research includes systematics, taxonomy, and molecular phylogenetics of Australia's truffle beetle fauna, a large and agriculturally significant—but completely undescribed-- group of insects. Ongoing research in biophotonics focuses on the evolution and development of self-assembling chitin-based photonic crystals in iridescent beetles.

April 2010-present: Lecturer for BIOL3115/ BIOL 2113- Entomology/ Invertebrate Zoology at Australian National University: lectures focus on basic systematics, morphology, and evolution of holometabolous insects. Supervised undergraduate student training in basic entomology techniques, including fieldwork, specimen preparation, and identification.

June 2008– April 2011: NSF-supported postdoctoral researcher in CSIRO Entomology, Canberra, Australia. Research included assembly of large-scale molecular and morphological datasets for phylogenetic inference, systematics and taxonomy of straphylinoid beetles, and several cross-disciplinary projects investigating the physics and evolution of structural colours in insects. Co-supervised (with Tara Sutherland, Sarah Weisman) honours student research in scarab beetle structural colour mechanisms.

August 2007– May 2008: UC Berkeley, Graduate Student Researcher: Lab management, Will lab (PCR, microscopy training for new users, general maintenance). Supervised undergraduate honours student training in entomology and scientific illustration.

August 2006- May 2007: Taxonomic contributor, web designer, and scientific illustrator, Berkeley Bio-Keys project (biokeys.berkeley.edu)

June-August 2006: Entomology Instructor, Academic Talent Development Program, UC Berkeley: wrote lectures and designed hands-on entomology lessons for 7th- and 8th-grade students.

August 2005- May 2006: Curatorial assistant, Essig Museum of Entomology: assisted with museum duties (tours, loans, outreach activities); redesigned museum website; produced annual newsletter for sponsors and alumni

January-May 2004, 2005: Graduate Student Instructor: ESPM 140, Introductory Entomology: designed laboratory curriculum on insect systematics; designed lab

exercises and handouts; wrote, administered, and graded lab practical exams (senior undergraduate and graduate students)

June-August 2004: Environmental Science Instructor, Early Academic Opportunities Program, University of California Berkeley:: designed environmental science/ ecology lesson plan for 9th- and 10th-grade students; wrote course handbook, delivered three four-hour lectures per week.

May- August 2002: Research assistant, Harrington Lab, Cornell University: collection, identification, and creation of taxonomic keys for potential West Nile vector mosquito species

MAJOR GRANTS

2011: Australian Biological Resources Study (ABRS) three-year postdoctoral fellowship, $270,000 in research funding and salary support
2009: Merit-based grant for synchrotron beamtime, Australian Synchrotron, ~$4,000 in travel funding, equipment use, and technical support.
2007: NSF Doctoral Dissertation Improvement Grant, $12,000 in research funding towards completion of PhD dissertation (DEB-0710239)

ACADEMIC HONORS AND SMALL GRANTS

2007: Linnean Society/ Systematics Association: Systematics Research Fund award (travel to New Zealand in support of fieldwork)
2007: Recipient, UC Berkeley Graduate Division Conference Travel Grant
2007: ESPM departmental grant for conference travel
2006: Recipient, Robert L. Usinger Memorial Prize in Entomology
2006: Recipient, Walker Fund (travel to Australia in support of fieldwork)
2005: Recipient, Harvey I. Magy Memorial Scholarship
2005: Recipient, Walker Fund (travel to MCZ, MTEC)
2005: Entomology Students' Organization- travel grant to attend ESA Annual Meeting
2004: Entomology Students' Organization- travel grant to attend ESA Annual Meeting
2004: NSF Graduate Research Fellowship: Honorable Mention
2004: Recipient, Walker Fund (grant for travel to Australia)
2004: ESPM departmental grant for summer research
2004: ASUC/ Academic Opportunity Fund- grant for summer research 2003: Entomology Students' Organization- travel grant to attend ESA Annual Meeting
2003: Dean's Award, Cornell University (best academic performance in major), Dean's List, 6 semesters
2001: Student research internship; Smithsonian Institution, National Museum of Natural History (Research Training Program).
1999-2003: Cornell Presidential Research Scholar; $10,000 in research funding plus training, poster, and seminar opportunities

OTHER AWARDS

2010. Coleopterists Society Lacordaire prize [best publication based on a dissertation]
2009. "Most Stunning Images of 2008," New Scientist, December 2008. [photograph of tiger beetle reflector from Seago et al., 2009]
2008: Award for best student talk. Iridescence: More than Meets the Eye [first international conference on biological iridescence], Tempe, AZ, USA.
2007: Student Competition for the President's Prize- 2nd place, Section A. ESA Annual Meeting, San Diego, CA, USA.

PRESENTATIONS

Invited Talks

"Beetles as optical engineers: the evolution and diversity of 3-D photonic crystals in Coleoptera." Macquarie University animal colour workshop, December 8 2011.

"Gold bugs and beyond: The evolution of beetle iridescence." University of Sydney School of Biological Sciences seminar series, May 25 2011.

"From truffle beetles to opal weevils: phylogenetics and the origins of beetle diversity." ANU Ecology and Evolution Tempo & Mode seminar series, November 3 2010.

"New perspectives on beetle evolution: from phylogenetics to photonics." CSIRO Entomology Executive Team Meeting, March 25 2009.

"Radiant rutelines and spectral sericines: the optics of beetle iridescence." Entomological Society of America Annual Meeting (SOLA Scarab Workers symposium), November 6, 2005.

"Unusual structural colors in Coleoptera." Entomology seminar, Louisiana State University, March 23, 2005.

"Beetle-hunting in Gondwana: A field report from Australia, New Zealand, and Chile." Pacific Coast Entomological Society, April 21, 2006.

Symposia and Conference Talks

"What can morphology offer in the era of molecular phylogenetics? Assembling the beetle tree of life using morphological data." Entomological Society of America Annual Meeting (SEB Systematics section), Reno, NV, November 13-16, 2011.

"Phylogeny and classification of Coccinellidae (Coleoptera) Entomological Society of America Annual Meeting (SEB Systematics section), San Diego, CA, December 12-15 2010.

"Morphological and molecular phylogenetics of Coccinellidae." Entomological Society of America Annual Meeting (SEB Systematics section), Indianapolis, IN, December 13-16, 2009.

"Evolution of round fungus beetles: phylogenetics, classification, and patterns of diversification (Coleoptera: Leiodidae)." Darwin 200: Evolution and Biodiversity, Darwin, NT, September 25-28, 2009.

"Spectral iridescence in Coleoptera: the evolution and function of beetle diffraction gratings." Iridescence: More than Meets the Eye, Arizona State University, Tempe, AZ, February 6-9, 2008.

"Molecular systematics and evolutionary trends in Leiodidae (Coleoptera: Staphylinoidea)." Entomological Society of America Annual Meeting (Student competition, Section A), San Diego, CA, December 9-12 2007.

"Leiodids: Diversity in a plain brown wrapper." Entomological Society of America Annual Meeting (Section A symposium), Indianapolis, IN, December 10-13 2006.

"Diffraction gratings in Coleoptera: the mechanism and distribution of unusual structural colors." Entomological Society of America Annual Meeting (Student competition, Section A), Salt Lake City, UT, November 14–17 2004.

"Iridescence and structural colors in insects." Integrative Biology: Biomechanics seminar series, Berkeley, CA, Fall 2004.

Posters

"Structural colors in Coleoptera: the evolution and function of beetle iridescence." Pacific Branch Entomological Society of America Annual Meeting, Portland OR, March 25-28 2007.

"A survey of color production mechanisms in Carabidae." (with K. Will) 2006 International Carabidologists Meeting, Pittsburgh PA. June 7-10 2006.

"Spectral iridescence in Coleoptera: Optical mechanisms and evolutionary significance." Evolution Annual Meeting, Fairbanks, Alaska. June 10-14, 2005.

"New findings on Agyrtodini, with adult and larval descriptions (Coleoptera: Leiodidae)." XXII International Congress of Entomology, Brisbane, Australia. August 15-21, 2004.

"Diffraction gratings in insect cuticle and spectral iridescence in Coleoptera." XXII International Congress of Entomology, Brisbane, Australia. August 15- 21, 2004.

PROFESSIONAL MEMBERSHIPS

Australian Entomological Society
Entomological Society of America
Society of Systematic Biologists
Coleopterists Society
Entomology Students Organization, UC Berkeley
    ESO president, 2005-2006

FIELDWORK

February 2009: Western Australia
November 2007: New Zealand, South Island
January 2007: Southern Chile
November 2006: Australia, SE Victoria
January 2006: Southern Chile
November 2005: New Zealand (both islands)
August 2004: Australia, Victoria, New South Wales, SE Queensland
July 2003: New Zealand (North Island); Australia, ACT
Spring 2002: Costa Rica, OTS La Selva station
Spring 2001: Southern Chile

MUSEUM WORK

American Museum of Natural History, New York (AMNH)
Australian Museum, Sydney (AM)
Australian National Insect Collection/CSIRO, Canberra (ANIC)
Bohart Museum of Entomology, UC Davis (UCDC)
California Academy of Sciences, San Francisco (CAS)
Cornell University Insect Collection, Ithaca NY (CUIC)
Essig Museum, UC Berkeley (EMEC)
Field Museum of Natural History, Chicago (FMNH)
Florida State Arthropod Collection, Gainesville (FSCA)
Juan-Enrique Barriga Collection, Curico, Chile (JEBC)
Louisiana State Arthropod Museum, Baton Rouge (LSAM)
Lincoln University, Christchurch, NZ (LUNZ)
Montana Entomology Collection, MSU (MTEC)
Musée National d'Histoire Naturelle, Paris (MNHN)
Museo Nacional de Historia Natural de Chile, Santiago (MNHNC)
Museum of Comparative Zoology, Harvard (MCZ)
Museum of Victoria, Melbourne (MVMA)
Natural History Museum, London (BNHM)
New Zealand Arthropod Collection, Auckland (NZAC)
Queensland Museum, Brisbane (QM)
Smithsonian Museum of Natural History, Washington D.C. (NMNH)
Snow Museum, U. Kansas, Lawrence KS (SNOW)
University of Arizona Insect Collection, Tucson (UAIC)
Universidad Austral de Chile, Valdivia (CFUA)