

# CHRISTOPHER D. BEATTY

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## **CURRENT POSITION**

SANTA CLARA UNIVERSITY, Santa Clara, California  
LECTURER IN ECOLOGY & EVOLUTION, 2009-PRESENT  
Supervisor: Janice Edgerly-Rooks, Department Chair

## **EDUCATION**

UNIVERSIDAD DE VIGO, Pontevedra, Spain  
SPANISH MINISTRY OF EDUCATION & SCIENCE, POSTDOCTORAL FELLOW 2007-2009  
Supervisor: Adolfo Cordero-Rivera

CARLETON UNIVERSITY, Ottawa, Ontario, Canada  
Ph.D. BIOLOGY 2006  
Supervisor: Thomas N. Sherratt; External Examiner: Michael P. Speed  
Thesis: *Warning Signal Evolution in Natural and Virtual Populations.*

OREGON STATE UNIVERSITY, Corvallis, Oregon, USA  
M.S. ENVIRONMENTAL SCIENCE-ECOLOGY 2002  
Supervisors: Paul C. Jepson, Judith L. Li  
Thesis: *Habitat Associations and Life Histories of Odonata in Riverine Wetlands of the Willamette Valley, Oregon.*  
Coursework emphasis in community ecology, insect ecology and systematics.

UNIVERSITY OF ILLINOIS, Urbana, Illinois, USA  
B.S. ECOLOGY, ETHOLOGY & EVOLUTION 1996  
Specialized curriculum including graduate-level courses in freshwater ecology and evolutionary ecology.

## **PROFESSIONAL QUALIFICATIONS**

- Excellent teaching skills (I have consistently received high marks in instructor evaluations) with experience in dealing with large classes and lecture/laboratory coordination.
- Excellent publication record, with a number of papers in top research journals.
- Extensive experience in field research on insect behavior and ecology, performing observational surveys as well as quantitative field experiments.
- Familiarity with molecular analytical techniques including PCR, as well as phylogenetic theory and methods. Also familiar with simulation modeling techniques, primarily utilizing Visual Basic for model generation.
- Successful record of funding acquisition; I have received research grants from university and government sources, as well as private funding entities.

## PUBLICATIONS

### ARTICLES:

#### *Published/In Press*

1. T. N. Sherratt & **C. D. Beatty** 2003. The evolution of warning signals as reliable indicators of prey defense. *The American Naturalist* **162(4)**: 377-389. (featured in a News & Views article in *Nature* and an editor's review in *American Entomologist*)
2. T. N. Sherratt, A. Rashed & **C. D. Beatty** 2004. The evolution of locomotory behaviour in profitable and unprofitable simulated prey. *Oecologia* **138**: 143-150.
3. **C. D. Beatty**, K. Beirinckx & T. N. Sherratt 2004. The evolution of müllerian mimicry in multispecies communities. *Nature* **431(7004)**: 63-66.
4. **C. D. Beatty**, R. S. Bain & T. N. Sherratt 2005. The evolution of aggregation in profitable and unprofitable prey. *Animal Behaviour* **70**: 199-208.
5. T. N. Sherratt & **C. D. Beatty** 2005. Island of the Clones. *Nature* **435(7045)**: 1039-1040.
6. T. N. Sherratt, A. Rashed & **C. D. Beatty** 2005. Hiding in Plain Sight. *Trends in Ecology and Evolution* **20(8)**: 414-416.
7. A. Rashed, **C. D. Beatty**, M. R. Forbes & T. N. Sherratt 2005. Prey selection by dragonflies in relation to prey size and wasp-like colours and patterns. *Animal Behaviour* **70**: 1195-1202.
8. H. Van Gossum, **C. D. Beatty** & T. N. Sherratt 2006. The Zygoptera of Viti Levu and Vanua Levu, the two larger islands in the Fiji archipelago. *IDF-Report* **9**: 1-14.
9. **C. D. Beatty**, H. Van Gossum & T. N. Sherratt 2007. *Nesobasis* species diversity and abundance: notes on an endemic damselfly genus of the Island group of Fiji (Zygoptera: Coenagrionidae). *Odonatologica* **36(1)**: 13-26
10. H. Van Gossum, **C. D. Beatty**, S. Charlat, H. Waqa, T. Markwell, J. H. Skevington, M. Tuiwawa & T. N. Sherratt 2007. Male rarity and putative sex-role reversal in Fijian damselflies (Odonata). *Journal of Tropical Ecology* **23(5)**: 591-598.
11. H. Van Gossum, **C. D. Beatty**, M. Tokota'a & T. N. Sherratt 2008. The Fijian *Nesobasis*: A further examination of species diversity and abundance (Odonata: Zygoptera). *Odonatologica* **37(3)**: 235-245.
12. M.O. Lorenzo Carballa, **C.D. Beatty**, C. Utzeri, V. Vieira & A. Cordero Rivera. 2009. Parthenogenetic *Ischnura bastata* populations in the Azores revisited: present status and notes on biology, behaviour and population ecology. *International Journal of Odonatology (in press)*.

#### *Submitted/In-prep*

13. **C. D. Beatty**, J. A. Andrés & T. N. Sherratt 2009. Conspicuous coloration in males of the damselfly *Nehalennia irene* (Zygoptera: Coenagrionidae): do males signal their unprofitability to other males? *Journal of Insect Behavior (submitted)*.
14. J. H. Skevington, **C. D. Beatty**, H. Van Gossum, T. W. Donnelly, T. N. Sherratt, A. Rashed & S. Kelso 2009. Molecular phylogenetics of *Nesobasis* and *Melanesobasis* (Odonata: Coenagrionidae): Exploring the evolution of a large insular insect radiation and resulting behavioural ramifications. *Molecular Phylogenetics and Evolution (submitted)*.
15. **C. D. Beatty**, A. Cordero-Rivera & T. N. Sherratt 2009. Body coloration in dragonflies and damselflies: conspicuous questions, elusive answers. Invited review for *Acta Ethologica (in prep)*.

16. **C. D. Beatty**, M.O. Lorenzo Carballa, K. M. Harding, H. Van Gossum, T. N. Sherratt & A. Cordero Rivera 2009. Female-biased sex ratios in the damselfly genus *Nesobasis* in Fiji: A role for endosymbionts? *Proceedings of the Royal Society of London Series B. (in prep)*.
17. **C. D. Beatty**, M.O. Lorenzo Carballa, M. Sanchez Herrera, K. M. Harding, T. N. Sherratt, J. Hoffmann, H. Van Gossum, J. Grados & A. Cordero Rivera 2009. Mechanisms for speciation in the damselfly genus *Polythore*: testing current species definitions. *Biological Journal of the Linnaean Society (in prep)*.
18. K. M. Harding, **C. D. Beatty**, M.O. Lorenzo Carballa, M. Sanchez Herrera, J. Hoffmann, T. N. Sherratt, H. Van Gossum & A. Cordero Rivera 2009. The damselfly genus *Polythore*: descriptions of the larvae of five Andean species, their ecology and distribution. *Zootaxa (in prep)*.
19. **C. D. Beatty**, H. Van Gossum, J. Odanga, C. Lange, M. Mutua & A. Cordero Rivera. 2009. Female conspicuousness in the African damselfly *Pseudagrion bicoeruleans*: why are females more colourful than males? *Tropical Ecology (in prep)*.

#### **BOOK CHAPTERS/GOVERNMENT PUBLICATIONS:**

20. **C. D. Beatty** & K. L. Streeter 1999. Assessment of Habitat Conditions and Invertebrate Assemblages in the Streams of the Lower Tualatin River Basin. Final Report, Water Environment Services of Clackamas County, Oregon, USA.
21. **C. D. Beatty**, S. Fraser, F. Pérez-Jvostov & T. N. Sherratt 2009. Dragonfly and Damselfly (Insecta: Odonata) Distributions in Ontario, Canada: Investigating the Influence of Climate Change. In: J. Ott (ed.) *Monitoring Climate Change with Dragonflies*, Pensoft Publishers (*in press*).
22. M.O. Lorenzo Carballa, **C. D. Beatty** & A. Cordero Rivera 2009. Parthenogenesis in island insects - the case study of *Isechnura hastata*. In: *Terrestrial Arthropods of Macaronesia – biodiversity, ecology and evolution*. (M. Boeiro & A. Serrano eds.) (*in press*).
23. **Beatty, C.D.** *On the trail of Macromia magnifica*. In *The Stream Bug Book: Stories and Encounters* J.L. Li & M. Barbour eds. Oregon State University Press (*in press*).

#### **INVITED PRESENTATIONS**

1. Mimics, models and myths: do the *Polythore* damselflies of Peru resemble toxic butterflies School of Natural Sciences and Psychology, Liverpool John Moores University, Liverpool, UK, November 24<sup>th</sup>, 2009
2. Sex-ratio distortion in Fijian damselflies: a role for endosymbionts? Department of Biological Science, University of Leeds, Leeds, UK, May 19<sup>th</sup>, 2009.
3. ¿Un ejemplo de Mimetismo? Las libélulas del género *Polythore* en Perú. Departamento de Biología, Universidad de La Coruña, La Coruña, Spain, May 7<sup>th</sup>, 2009.
4. Bosques encantados: las particularidades ecológicas de odonatos insulares tropicales. Departamento de Ecología y Biología Animal, Universidad de Vigo, Pontevedra, Spain, November 23<sup>rd</sup>, 2007.
5. Sex-ratios, sex-role reversal and speciation in island damselflies: the curious case of the *Nesobasis* of Fiji. Department of Entomology, Rutgers University, New Brunswick, New Jersey, October 12<sup>th</sup>, 2007.
6. Sex, behaviour and speciation: the curious case of the Fijian damselflies. School of Biological and Earth Sciences, Liverpool John Moores University, Liverpool, UK, July 20<sup>th</sup>, 2007
7. Sex-role reversal and sex-ratio distortion in endemic damselflies of the Fiji Islands: on the trail of the territorial female. Department of Fisheries and Wildlife, Oregon State University, Corvallis, Oregon, March 6<sup>th</sup>, 2006.
8. Warning signal evolution in natural and virtual populations. Center for Population Biology, University of California, Davis, California, February 28<sup>th</sup>, 2006.
9. Conspicuous coloration in males of the damselfly *Nehalennia irene* (Zygoptera: Coenagrionidae): do males signal their unprofitability to other males? Dragonfly Society of the Americas Annual Meeting, Arnprior, Ontario, July 9<sup>th</sup>, 2005.
10. Sexual dimorphism in Coenagrionid damselflies: could bright coloration in males be a warning signal? A study with *Nehalennia irene*. Ottawa Entomological Society, Ottawa, Ontario, March 17<sup>th</sup>, 2005.
11. Modeling the evolution of warning signals. Department of Biology, Trent University, Peterborough, Ontario, November 5<sup>th</sup>, 2003.

12. The evolution of warning signals as reliable indicators of prey defense. Department of Fisheries and Wildlife, Oregon State University, Corvallis, Oregon June 18<sup>th</sup>, 2003.

### **CONTRIBUTED PRESENTATIONS AND POSTERS**

1. *Wolbachia* dynamics through host evolutionary radiation: a case study in endemic Fijian damselflies. Poster, European Society of Evolutionary Biology Conference, Torino Italy, August 24<sup>th</sup>, 2009.
2. The damselfly genus *Polythore* (Zygoptera: Polythoridae): biogeography, ecology, and the potential for mimetic resemblance in multiple species. Presentation, Worldwide Dragonfly Association Conference, Xalapa Mexico June 9<sup>th</sup>, 2009.
3. Diversity in the Damselfly Genus *Polythore* (Odonata: Polythoridae): Evaluating Species Hypotheses. Poster, Gesellschaft Deutschsprachiger Odonatologen Biennial Conference, Basel, Switzerland March 21<sup>st</sup>, 2009.
4. Conspicuous coloration in males of the damselfly *Nehalennia irene* (Zygoptera: Coenagrionidae): do males signal their unprofitability to other males? Presentation, Worldwide Dragonfly Association Conference, Swakopmund, Namibia, April 19<sup>th</sup>, 2007
5. Sex-role reversal in an island community of damselflies (Odonata)? Presentation, International Society of Behavioural Ecology Congress, Tours, France, July 26<sup>th</sup>, 2006.
6. Conspicuous coloration in males of the damselfly *Nehalennia irene* (Zygoptera: Coenagrionidae): do males signal their unprofitability to other males? Presentation, Ontario Ecology and Ethology Colloquium, Carleton University, Ottawa, Ontario, May 9<sup>th</sup>, 2005
7. Conspicuous coloration in males of the damselfly *Nehalennia irene* (Zygoptera: Coenagrionidae): do males signal their unprofitability to other males? Presentation, Odonate Ecology and Evolution Symposium, Carleton University, Ottawa, Ontario, September 18<sup>th</sup>, 2004
8. The evolution of aggregation in profitable and unprofitable prey. Presentation, International Society of Behavioural Ecology Congress, University of Jyväskylä, Jyväskylä, Finland, July 12<sup>th</sup>, 2004.
9. The evolution of aggregation in profitable and unprofitable prey. Presentation, Ontario Ecology and Ethology Colloquium, University of Toronto at Mississauga, Mississauga, Ontario, May 12<sup>th</sup>, 2004.
10. The evolution of warning signals as reliable indicators of prey defence. Poster, Ontario Ecology and Ethology Colloquium, McMaster University, Hamilton, Ontario, May 3<sup>rd</sup>, 2003.
11. The evolution of movement behaviour in defended prey. Poster, Ontario Ecology and Ethology Colloquium, McMaster University, Hamilton, Ontario, May 3<sup>rd</sup>, 2003.
12. Odonata Life History Attributes in Wetland Habitat Assessment: Questions Beyond Species Diversity. Presentation, North American Benthological Society National Conference, Pittsburgh, Pennsylvania, May 30<sup>th</sup>, 2002.
13. Dragonfly and Damselfly (Insecta: Odonata) Habitat Use in the Wetlands of the Willamette Valley, Oregon. Presentation, North American Benthological Society National Conference, La Crosse, Wisconsin, June 5<sup>th</sup>, 2001.

### **RESEARCH GRANTS**

1. Spanish Ministry of Science and Innovation 2008-2011. *Sexual selection and the evolution of mating strategies in odonates*. PI: A. Cordero-Rivera (€185,000)
2. Spanish Ministry of Education and Science, Acciones Complementarias Internacionales 2007: *Mimetic coloration in the Damselfly family Polythoridae (Odonata: Zygoptera): anti-predator strategies in a novel taxonomic group* 2007 Lima, Peru (€15,590) PI: C.D. Beatty
3. Universidad de Vigo, Convocatoria de Ayudas Para Investigación 2007: *Novel mating strategies in the damselfly *Pseudagrion bicoerulans* (Odonata: Zygoptera): are females territorial?* Nairobi, Kenya (€1,520) PI: C.D. Beatty
4. Spanish Ministry of Education and Science, Juan de la Cierva Postdoctoral Fellow 2006: *Evolutionary ecology of reproductive strategies: Odonates as a model system*. Pontevedra, Spain (€72,000) PI: Christopher Beatty
5. National Geographic Society, Committee for Research and Exploration Grant 2006: *The role of parasites in driving the evolution of mating systems in a unique island community of damselflies* Suva, Fiji (\$19,900) PI: T.N. Sherratt
6. World Dragonfly Association, International Dragonfly Fund 2005: *Perplexing variation in mating systems in endemic island damselflies: a first example of sex-role reversal in odonates?* Suva, Fiji (\$6,000) PI: H. Van Gossum
7. Carleton University, Graduate Student Research Bursary 2005: Suva, Fiji (\$1,500) PI: C.D. Beatty

## **TEACHING EXPERIENCE**

**Lecturer:** Santa Clara University, BIO 156: *General Ecology*. Instructor of record for an upper-division course examining the factors that limit the distribution, abundance, and diversity of organisms, including the physical environment and interactions with other species. Topics: population dynamics, interspecific relationships, community structure, and ecosystem processes. Autumn 2009.

**Lecturer:** Universidad de Vigo, *Conservación de Biodiversidad*. Lecturer (in Spanish) for laboratory practicals for a fourth-year course on the issues, theory and practice of conservation biology. Topics: biological reserve design, assessment of diversity and richness at multiple scales, Island Biogeography Theory, dispersal and animal tracking technologies. Spring 2008, Autumn 2008.

**Lecturer:** University of Ottawa, BIO 1120: *Introduction to Organismal Biology*. Instructor of record for a team-taught first year survey course on the evidence for, and the fundamentals underlying the evolution of biological diversity. Topics: natural selection, speciation, the history of life, extinction, hominid evolution; adaptation and the geographical distribution of organisms; the effects of human population growth on the structure and function of ecological systems, and the implications of these effects to future human welfare. Autumn 2005.

**Lecturer:** Carleton University, BIOL 3602: *Conservation Biology*. Instructor of record/lab coordinator for third-year undergraduate course on the issues, theory and practice of conservation biology. Lecture topics included conservation management, landscape ecology and issues of scale, the species concept, economics and environmental ethics, politics and the media. Winter 2005.

**Teaching Assistant:** Carleton University, BIOL 3604: *Analysis of Ecological Relationships*. Instructed laboratory section for an introductory course on the statistical analysis of ecological data. Topics included the theory and practice of statistical analysis using a variety of statistical methods, including the t-test, GLM, and non-parametric methods. Winter 2005.

**Teaching Assistant:** Carleton University, BIOL 3602: *Conservation Biology*. Instructed laboratory section for third-year undergraduate students in issues and theory of conservation biology. Winter 2003, Winter 2004.

**Teaching Assistant:** Carleton University, BIOL 2600: *Introduction to Ecology*. Instructed laboratory section for second-year undergraduate students in ecological theory and methods. Coursework included topics in stream ecology, biometry, population dynamics and predator-prey interactions. Autumn 2002, Autumn 2003, Autumn 2004.

**Instructor:** Mt. Pisgah Arboretum, Eugene, Oregon: *Dragonfly Workshop* Developed and presented one-day workshops on dragonfly life history, ecology and diversity as part of public outreach program. Summer 2001, Spring 2002.

**Guest Lecturer:** Oregon State University, Biology 371: *Ecological Methods*. Conducted freshwater ecology sampling and identification laboratories for undergraduate science students. Spring 2001.

**Teaching Assistant:** Oregon State University, Biology 101-103: *Introduction to Biology*. Instructed laboratory and discussion sections for undergraduate students in a three-course general Biology series. Included: BI101-Diversity of life, ecology, population biology and human environmental impacts. BI102-Mendelian genetics, genetic engineering, evolution and behavior. BI103-Plant anatomy and physiology, human anatomy and physiology and human diseases. Spring 1999 through Autumn 2000

I have also assisted in the mentoring of two Undergraduate Honors students at Carleton University: David Lowe (2004) and Cory Warmington (2005). I am currently advising a Master's student, James Odanga, at Kenyatta University in Nairobi, Kenya, on a project assessing the impact of agricultural practices on odonate diversity in streams of the Athi River Valley in Kenya. I served on the thesis jury of Olalla Lorenzo-Carballa, a PhD student at the University of Vigo in Spain, in May of 2009.

## **SCHOLARSHIPS & AWARDS**

Universidad de Vigo, Bolsa de Viaje (Conference Travel Award) 2007: Swakopmund, Namibia (€800)  
Wyndham Memorial Scholarship for Outstanding Biology Graduate Student 2006 (\$3,800)  
Ontario Graduate Scholarship for International Students 2005-2006 (\$15,000)  
Carleton University, International Student Scholarship 2004-2006 (\$10,000)  
Carleton University, Graduate Scholarship 2002-2006 (\$12,800)  
OSU Entomology Department, First Place Masters student presentations 2001 (\$150)  
Oregon State University, Laurel Scholarship 2000 (\$8,000)  
Oregon State University, Sports Lottery Scholarship 2000 (\$5,000)  
University of Illinois, Hunter Memorial Scholarship (\$5,000)  
University of Illinois, Dean's List  
Illinois Science Teachers Association Award

## **PROFESSIONAL SERVICE**

Manuscripts/grant applications reviewed since 2003: *The American Naturalist* (1) *Animal Behaviour* (8), BBSRC-UK (1), *Behavioral Ecology* (1), *Biological Journal of the Linnean Society* (1), *The Canadian Entomologist* (1), *Ecography* (1), *Ecological Entomology* (4), *Journal of Insect Behavior* (3) *Journal of Zoology* (1); Books reviewed since 2003: Blackwell Scientific, *Fundamentals of Conservation Biology*; Oxford University Press, *Avoiding Attack*, *Big Questions in Ecology and Evolution*; Pensoft Publishers, *Forests and Dragonflies*.

Member: ***Editorial Board, Tropical Ecology***. Associate editor for the peer-reviewed journal of the International Society of Tropical Ecology. 2008-2011.

Member: ***Odonata Specialist Group, IUCN Red List Programme***. Assisting with the assessment of the status of odonate species in the South Pacific.

Organizer: Carleton University ***Evolution Discussion Group***: Organized weekly meetings of ecology/evolution journal club for graduate students and faculty. Autumn 2003-Summer 2005.

Volunteer instructor, Let's Talk Science program: Developed and presented program on ***Insect Diversity and Ecology*** for 8th grade classes in an Ottawa area school. Also gave presentation on insects to 5-7 year-olds at a local science summer camp. Autumn 2003-Winter 2005.

Fundraising and advertising committee chair: ***Ontario Ecology and Ethology Colloquium***. Graduate student-organized symposium sponsored by the Biology Department, College of Natural Sciences and Graduate Studies and Research Office at Carleton University. May 8<sup>th</sup>-9<sup>th</sup>, 2005.

Organizing committee member: ***Succeeding in Science: Challenges and Perspectives from Academia and Beyond***: Graduate student-organized symposium sponsored by the Ottawa-Carleton Institute of Biology and NSERC. April 14<sup>th</sup>-15<sup>th</sup>, 2005.

Organizing committee chair: ***Odonate Ecology and Evolution Symposium***: Organized an international symposium on dragonfly and damselfly research sponsored by the College of Natural Sciences and the Department of Biology at Carleton University. September 17<sup>th</sup>-19<sup>th</sup>, 2004.

Organizing committee member: ***Succeeding in Science: Canadian Challenges and Perspectives***: Graduate student-organized symposium sponsored by the Ottawa-Carleton Institute of Biology and NSERC. April 14<sup>th</sup>-15<sup>th</sup>, 2004.

Organizing committee member: ***Crossing Boundaries: Environmental Science and Society***: Graduate student-organized symposium sponsored by the Joint Environmental Sciences programs at Oregon State University, Portland State University and the University of Oregon. May 5<sup>th</sup>, 2000.