

DR. NALINI PUNIAMOORTHY

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EDUCATIONAL TRAINING

2013 Oct - present	Long-term Postdoctoral research Department of Biology, Syracuse University
2013 May-Aug	Short-term Postdoctoral research Institute of Systematic Botany, University of Zurich
2008- 2013	PhD. in Evolutionary Biology Institute of Evolutionary Biology & Environmental Studies, University of Zurich
2006- 2008	MSc. in Biology Department of Biological Sciences, National University of Singapore
2002- 2006	BSc. in Life Sciences (hons; 2nd upper) University Scholars Programme (Admits top 5-7% of NUS students) National University of Singapore

RESEARCH INTERESTS

Evolutionary biology and behavioral ecology

I am interested in the role of ecological and sexual selection in driving speciation. I am currently using well-established insect models as well as non-model systems to address the following:

- Experimental evolution of pre- vs. post- mating episodes of reproductive isolation.
- Sperm competition and resolving mechanisms of competitive fertilization success.
- Reproductive parasites and male-killing endosymbionts in Diptera.
- Questioning eco-toxicology: Evolution of ivermectin resistance in insects.

GRANTS & AWARDS

NUS Overseas Postdoctoral Fellowship 2014

- Postdoctoral research fellowship awarded by the National University of Singapore to conduct research abroad (24 months; approx. USD 90000).

SNSF Early Postdoc.Mobility 2013

- Postdoctoral research fellowship awarded by the Swiss National Science Foundation to conduct research abroad (18 months; USD 66000).

UZH Postdoctoral funding 2013

- Short-term postdoctoral funding from the Faculty of Science, University of Zurich (4 months; CHF 15000).

STRI Short-term research fellowship 2010.

- Awarded by the Smithsonian Tropical Research Institute to conduct a short-term research project on the Barro Colorado Island, Panama and in San Jose, Costa Rica (4 months; USD 5000).

NUS- Overseas Graduate Scholarship 2008.

- Awarded by the National University of Singapore pursue a PhD. in Evolutionary Biology at the University of Zurich, Switzerland (4 year funding).

NUS- Research Scholarship 2006.

- Awarded by the National University of Singapore pursue a MSc. in Biology in the Department of Biological Sciences (2 year funding).

Teaching Excellence Award AY2006/07.

- Awarded by the Faculty of Science, National University of Singapore to select graduate students for excellence in teaching.

Additional travel awards & prizes

- Swiss Zoological Society Travel Award 2012 (CHF 1300).
- Prize for best student presentation, Biology11, Switzerland (CHF 500).
- Society for the Study of Evolution Student Travel Award 2007 (USD 1500).
- Best academic thesis in Life Sciences (Biology), Lijen Industrial Development Medal, NUS 2006.
- Top graduating student in Life Sciences (Biology), The Wallace Book Prize, NUS 2006 (SGD 100).
- Willi Hennig Society Marie Stopes Student Travel Award 2005 (USD 500).
- Honorary Mention in Student Competition, XXIV Meeting of the Willi Hennig Society 2005.

PUBLICATION RECORD

Total number of publications: 20

Total number citations (excluding self-citations): 144

Author h-index: 8

20. Rohner, P.T., W.U. Blanckenhorn and **N. Puniamoorthy**. 2016. *Sexual selection on male size drives the evolution of male-biased sexual size dimorphism*. Evolution (in press)
19. Lüpold, S., M.K. Manier, **N. Puniamoorthy**, C. Schoff, W.T. Starmer, S.H. Lüpold, J.M. Belote and S. Pitnick. 2016. *How sexual selection can drive the evolution of costly sperm ornamentation*. Nature (in press)
18. Blanckenhorn, W.U., R. Gautier, M. Nick, **N. Puniamoorthy** and M.A. Schäfer. 2014. *Stage- and sex-specific heat tolerance in the yellow dung fly *Scathophaga stercoraria**. Journal of Thermal Biology (46: 1-9.)
17. **Puniamoorthy, N.** 2014. *Behavioural barriers to reproduction may evolve faster than sexual morphology among populations of a dung fly (Sepsidae)*. Animal Behaviour (98: 139-148)
16. Rohner, P.*, Y. Ang, L. Zhao, **N. Puniamoorthy**, W.U. Blanckenhorn and R. Meier. 2014. *Genetic data confirm the species status of *Sepsis nigripes* Meigen, 1826 (Diptera: Sepsidae) and adds one species to the Alpine fauna while questioning the synonymy of *Sepsis helvetica* Munari, 1985*. Invertebrate Systematics (28: 555-563)
15. **Puniamoorthy, N.**, M.A. Schäfer, J. Römbke, R. Meier and W.U. Blanckenhorn. 2014. *Ivermectin sensitivity is an ancient trait affecting all ecdysozoa but shows phylogenetic clustering among sepsid flies*. Evolutionary Applications 7: 548-554

14. Martin, O.Y., **N. Puniamoorthy**, A. Gubler, C. Wimmer*, C. Germann and M.V. Bernasconi. 2013. *Infections with the microbe Cardinium in the Dolichopodidae and other Empidoidea (Diptera)*. Journal of Insect Science 13:47.
13. Ang, Y.C., J. Puniamoorthy, A.C. Pont, M. Bartak, W.U. Blanckenhorn, W.G. Eberhard, **N. Puniamoorthy**, V. Silva, L. Munari and R. Meier. 2013. *A plea for digital reference collections and other science-based digitization initiatives in taxonomy: Sepsidnet as exemplar*. Systematic Entomology 38: 637-644.
12. Martin, O.Y., **N. Puniamoorthy**, A. Gubler, C. Wimmer* and M.V. Bernasconi. 2013. *Infections with Wolbachia, Spiroplasma, and Rickettsia in the Dolichopodidae and other Empidoidea*. Infection, Genetics and Evolution, 13:317-330.
11. Blanckenhorn, W.U, **N.Puniamoorthy**, M.A. Schäfer, A. Scheffczyk and J. Römbke. 2013. *Standardized laboratory tests with 21 species of temperate and tropical sepsid flies confirm their suitability as bioassays of pharmaceutical residues (ivermectin) in cattle dung* Ecotoxicology and Environmental Safety 89:15-20.
10. Blanckenhorn, W.U., **N.Puniamoorthy**, A. Scheffczyk and J. Römbke. 2013. *Evaluation of ecotoxicological effects of the parasiticide moxidectin in comparison to ivermectin in 11 species of dung flies*. Ecotoxicology and Environmental Safety 89:21-28.
09. **Puniamoorthy, N.**, Blanckenhorn, W. U. and Schäfer, M. A. 2012. *Differential investment in pre- vs. post-copulatory sexual selection reinforces a cross-continental reversal of sexual size dimorphism in Sepsis punctum (Diptera: Sepsidae)*. Journal of Evolutionary Biology 25: 2253–2263.
08. **Puniamoorthy, N.**, M. A. Schäfer and W. U. Blanckenhorn. 2012. *Sexual selection accounts for the geographic reversal of sexual size dimorphism in the dung fly, Sepsis punctum*. Evolution 66: 2117–2126.
07. **Puniamoorthy, N.**, M. Kotrba and R. Meier. 2010. *Unlocking the ‘Black Box’: Female genitalia in Sepsidae (Diptera) evolves fast and is specific to most species*. BMC Evolutionary Biology 10:275.
06. Römbke, J., K.D. Floate, R. Jochmann, M.A. Schäfer, **N. Puniamoorthy**, S. Knäbe, J. Lehmus, B. Rosenkranz, A. Scheffczyk, T. Schmidt, A. Sharples and W.U. Blanckenhorn. 2009. *Lethal and sublethal toxic effects of a test chemical (Ivermectin) on the yellow dung fly (Scathophaga stercoraria) based on a standardized international ring test*. Environmental Toxicology and Chemistry, 28(10): 2117-2124.
05. **Puniamoorthy, N.**, M.Rifqi*, D. Tan* and R. Meier. 2009. *From Kissing to Belly Stridulation: Comparative Analysis Reveals Surprising Diversity, Rapid Evolution, and much Homoplasy in the Mating Behavior of 27 Species of Sepsid Flies (Diptera: Sepsidae)*. Journal of Evolutionary Biology. 22: 2146-2156.
04. **Puniamoorthy, N.**, K.F.Y. Su, R. Meier. 2008. *Bending for love: losses and gains of sexual dimorphisms are strictly correlated with changes in the mounting position of sepsid flies (Sepsidae: Diptera)*. BMC Evolutionary Biology 8:155.
03. Ang, Y., **N. Puniamoorthy** and R. Meier. 2008. *Secondarily reduced foreleg armature in Perochaeta dikowi sp.n. (Diptera: Cyclorrhapha: Sepsidae) due to a novel mounting technique*. Systematic Entomology 33: 552-559.
02. Ingram, K.K., T. Laamanen, **N. Puniamoorthy** and R. Meier. 2008. *Lack of Morphological Coevolution Between Male Forelegs and Female Wings in Themira (Sepsidae: Diptera: Insecta)*. Biological Journal of the Linnean Society 93: 227-238.
01. **Puniamoorthy, N.**, J. Jeevanandam and S. Kutty. 2008. *Give south Indian authors their true names*. Nature 452: 530.

* Undergraduate researcher

TALKS AND CONFERENCE PARTICIPATION

Conferences

- 2015 **Puniamoorthy, N.** *Geographic variation in polyandry, size dimorphism and sperm competition.* Plenary talk at 13th Biology of Spermatozoa meeting, Sheffield, United Kingdom.
- 2014 **Puniamoorthy, N.,** S. Pitnick, F.P. Schiestl and W.U. Blanckenhorn. *Sexual selection, sperm competition and incipient speciation in a widespread dung fly, Sepsis punctum (Sepsidae).* Oral presentation at 8th International congress of Dipterology, Potsdam, Germany (with abstract).
- Rohner, P.*, W.U. Blanckenhorn and **N. Puniamoorthy.** *Cross-continental variation in sexual selection & its effect on the contrasting reversal of sexual size dimorphism in closely related sepsid fly species.* Oral presentation at 8th International congress of Dipterology, Potsdam, Germany (with abstract).
- Rohner, P.*, Y. Ang, L. Zhao, **N. Puniamoorthy,** W.U. Blanckenhorn and R. Meier. *Genetic data confirm the species status of Sepsis nigripes Meigen while questioning the synonymy of Sepsis helvetica Munari (Diptera: Sepsidae).* Poster presentation at 8th International congress of Dipterology, Potsdam, Germany (with abstract).
- Puniamoorthy, N.** and S. Pitnick. *Sexual selection and sperm competition in a widespread dung fly, Sepsis punctum (Sepsidae).* Oral presentation at Evolution Meeting, Raleigh, North Carolina, USA (with abstract).
- 2013 **Puniamoorthy, N.** and W.U. Blanckenhorn. *Mating behavior evolves faster than morphology: Population differentiation in a neotropical fly, Archisepsis diversiformis.* Poster presentation at 14th Congress of the European Society for Evolutionary Biology, Lisbon, Portugal. (with abstract).
- Rohner, P.*, W.U. Blanckenhorn and **N. Puniamoorthy.** *Cross-continental variation in sexual selection: Contrasting reversal of sexual size dimorphism in closely related sepsid flies.* Poster presentation at 14th Congress of the European Society for Evolutionary Biology, Lisbon, Portugal. (with abstract).
- Puniamoorthy, N.** and W.U. Blanckenhorn. *Pre- vs. Post-copulatory sexual selection in Sepsis punctum.* Poster presentation at 12th Biology of Spermatozoa meeting, Sheffield, United Kingdom.
- 2012 **Puniamoorthy, N.** and W.U. Blanckenhorn. *Differential investment in pre- versus post-copulatory sexual selection reinforces a cross-continental reversal in sexual size dimorphism in a widespread dung fly (Sepsidae: Diptera).* Oral presentation at the 1st Joint Congress of Evolutionary Biology, Ottawa, Canada.
- 2011 **Puniamoorthy, N.,** M.A. Schäfer and W.U. Blanckenhorn. *Geographic reversal of sexual size dimorphism in a dung fly Sepsis punctum (Sepsidae).* Oral presentation at the Biology11 meeting, Zurich, Switzerland.
- Puniamoorthy, N.,** and R. Meier. *Rapid divergence of internal female genitalia between recently diverged sister taxa, as revealed by a comparative study of 41 sepsid species (Sepsidae: Diptera).* Poster presentation at the 13th Congress of the European Society for Evolutionary Biology, Tuebingen, Germany. (with abstract).

- 2010 **Puniamoorthy, N.**, Kotrba, M. and R. Meier. *Diverse females: Rapid evolution of the internal female genitalia in Sepsidae (Diptera)*. Oral presentation at the 7th International Congress of Dipterology, San Jose, Costa Rica (with abstract).
- 2009 **Puniamoorthy, N.**, Kotrba, M. Meier, R. *The 'inside-story': Evolution of the female internal reproductive system in Sepsidae (Diptera)*. 12th Congress of the European Society for Evolutionary Biology, Turin, Italy.
- 2007 **Puniamoorthy, N.** and R. Meier. 2007. *Sex, Flies and Videotape: A study of morphology and mating behaviour in Sepsidae (Diptera)*. Oral presentation at the Evolution Meeting, Christchurch, New Zealand.
- 2006 **Puniamoorthy, N** and R. Meier. *The Tree of Love: The Evolution of Mating Behaviour in Sepsidae (Diptera)*. Oral presentation at the 6th International Congress of Dipterology, Fukuoka, Japan (with abstract).
- Puniamoorthy, N** and R. Meier. 2006. *'Size Matters!'- Mating success determined by male-to-female size ratio in Sepsis dissimilis*. Poster presentation the 6th International Congress of Dipterology, Fukuoka, Japan (with abstract).
- 2005 **Puniamoorthy, N** and R. Meier. *A Comparative Study of Mating Behaviour in Sepsidae (Diptera)*. Oral presentation in the XXIV.Meeting of the Willi Hennig Society, Fagernes, Norway (with abstract).
- Puniamoorthy, N**, Kathy Feng-Yi Su and R. Meier. *Sex, Flies and Videotape: The evolution of mating behaviour in Sepsidae (Diptera)*. Poster presentation in the 10th Biological Sciences Graduate Congress, Singapore (with abstract).

University Seminars - Invited speaker

- Aquatic Ecology and Macroevolution seminar series, EAWAG, Switzerland, September' 15.
- Ecology, Evolution and Environment Series, Sheffield University, United Kingdom. October '14.
- Ecology, Evolution and Behaviour Seminar, Queen's University, Canada. September '14.
- Departmental seminar, Department of Biology, Syracuse University, USA. September '12.
- Biology Seminar Series, George Washington University, USA. April '14.
- Evolutionary Biology Seminar, University of Stirling, United Kingdom. May '13.
- Evolutionary Biology Seminar, Bielefeld University, Germany. October '12.
- Zurich Interaction seminar, ETH Zurich, Switzerland. April '11.
- Behavioral Ecology seminar series, School of Biology, University of Costa Rica, San Jose, Costa Rica. September '10.
- Special seminar, In conjunction with the opening of exhibit at the Zoological Museum, University of Zurich. June '07.
- Guest seminar, Bavarian State collection of Zoology, Munich, Germany. July '07.

REVIEWER FOR INTERNATIONAL JOURNALS

Behavioural Processes, Physiological Entomology, Functional Ecology, Organisms Diversity and Evolution, Cladistics, Ecological Entomology, BMC Evolutionary Biology, Zoology, Biological Journal of the Linnean Society, Ecological Entomology, PLoS ONE, Evolution, Proceedings of the National Academy of Sciences, Journal of Insect Science, Behavioural Processes.

TEACHING EXPERIENCE

Teaching Assistant

- Department of Biology & University Scholars Programme, NUS (2006 – 2008)

- Biodiversity (LSM 1103); Evolution and Comparative Genomics (LSM 3252); Ecology and Environmental processes (LSM 3251); Evolution (ULS 2202).
- Institute of Evolutionary Biology and Environmental Studies, University of Zurich (2008– 2011)
 - Evolution (BIO 113); Biology of Reproduction (BIO 361)

Module co-ordinator/ co-organizer

- Institute of Evolutionary Biology and Environmental Studies, University of Zurich (2012– 2013)
 - Principles of Evolution practical course (BIO 352); Biology of Reproduction block course (BIO 361); Experimental Ecology / Zurich Interaction seminar series (jointly organised with ETH-Zurich, 551-0737-00L).

Guest lecturer

- Field Course in Alpine Biology, School of Biological and Environmental Sciences, University of Stirling, United Kingdom. June '10.

Mentoring/ co-supervising undergraduate research

- I have mentored and co-supervised 18 undergraduate and 2 masters students thus far, in the labs of Dr. Rudolf Meier (NUS), Dr. Wolf Blanckenhorn (UZH) & Dr. Scott Pitnick (SU). A large portion of the undergraduate work has led to publications and further research, with 6 students having co-authorship (see publication list).

SERVICES FOR PUBLIC / COMMUNITY INVOLVEMENT

USA

- Invited speaker, Promoting diversity in STEM fields, Open dialogue with undergraduates interested in science, George Washington University, April 2014.

Switzerland

- Involved in DOTTs (Dung Organism Toxicity Test Standardization), International group for advisory service and elaboration of regulations regarding influence of residues of farm animal medication on dung fauna (2009 – 2013).
- BioDiversity in Switzerland, Prepared museum exhibit at Zoological Museum, University of Zurich 2007 - 2008 (in German and English)

Singapore

- NUS Tamil Language Society, President 2003 - 2004. Alumni 2005 – present.
- Mentor and member, Singapore Indian Development Association and Singapore Indian Education Trust 2003 - present.
- Organising Committee, Non-profit project, *NUS Indian Cultural Society's Motivational Camp for Indian youths* (2008).

REFERENCES

Prof. Dr. Scott Pitnick Dept. of Biology, Syracuse University, Life Sciences Complex, 107 College Place, Syracuse, New York 13244, USA.

Prof. Dr. Wolf Blanckenhorn Inst. of Evolutionary Biology & Environmental Sciences, University of Zurich, Winterthurerstrasse 190, Zurich 8057, Switzerland.

Prof. Dr. Rudolf Meier Dept. of Biological Sciences, National University of Singapore, 14 Science Dr. 4, Singapore 117543.