

MICHAEL F. WHITING

CURRICULUM VITAE

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Education:

B.S. in Zoology with emphasis in Entomology, Cum Laude, Brigham Young University, Provo Utah. 1990
Ph.D. in Entomology, Cornell University, James K. Liebherr advisor. Dissertation title: *Phylogeny of the Holometabola based on Molecular and Morphological Evidence with Emphasis on the Placement of the Strepsiptera*. 1995.

Fellowships, Scholarships, Awards:

College of Biology and Agriculture, Creative Achievement Award	2003
Brigham Young University Young Investigator Award	2001-2004
Presidential Early Career Award in Science and Engineering (PECASE) finalist.	2000
National Science Foundation CAREER Award Winner	2000
NSF/Sloan Postdoctoral Fellowship, American Museum of Natural History	1994-1995
Kalbfleisch Postdoctoral Research Fellowship, American Museum of Natural History (declined)	1994
Ernst Mayr Award Winner (First Place student paper, Society of Systematic Biologists).	1993
Presidential Award (Second Place student paper, Entomological Society of America).	1993
Presidential Award (First Place student paper, Entomological Society of America).	1992
Liberty Hyde Bailey Graduate Fellowship, Cornell University	1990-1993
Sage Graduate Fellowship, Cornell University	1990
NSF Graduate Fellowship	1990-1992

Professional Experience:

Associate Professor, Department of Zoology, Brigham Young University	2003-present
Associate Curator of Insects, Monte L. Bean Museum, Brigham Young University	2003-present
Director, DNA Sequencing Facility, Brigham Young University	1997-present
Assistant Curator of Insects, Monte L. Bean Museum, Brigham Young University	1997-2002
Assistant Professor, Department of Zoology, Brigham Young University	1997-2002
Postdoctoral Fellow, Rob DeSalle, American Museum of Natural History	1995-1996
Research Assistant, Ward Wheeler, American Museum of Natural History	1990-1994
Research Intern, Chris Simon, University of Hawaii	1989
Research Assistant, Richard Baumann, Brigham Young University	1985-1989

Professional Services:

Editorial Adviser, Systematic Entomology	2000-present
Editorial Board, Molecular Phylogenetics and Evolution,	2000-present
Editorial Board, Invertebrate Systematics,	2003-present

Symposium Organizer:

Entomological Society of America Annual Meeting, San Diego California, Dec. 9-12, 2001. "*Neglected but not rejected, Phylogeny of the Microdiverse Insect Orders*"

XXI International Congress of Entomology, Iguassu Brazil, Aug 20-26 2000, “*The Holometabola: Phylogeny and evolution of the most successful terrestrial clade*”
Entomological Society of America Annual Meetings, Cincinnati Ohio, October 28, 2003, “*Arthropod Systematics in the Informatics Age*”

Invited Participant:

NSF MorphoBank Workshop, American Museum of Natural History, Dec 9-11, 2001.

Reviewer (Granting Agencies)

National Science Foundation
Australian Research Council

NSF Review Panels

Systematics Panel (Nov 1997)
Systematics Panel (May 2002)
Systematics Panel (May 2003)

Reviewer (Journals)

Cladistics	Novitates
ESA Annals	Proceedings of the Royal Society: Biological Sciences
Evolution	Systematic Biology
Molecular Phylogenetics and Evolution	Systematic Entomology
Nature	Zoologica Scripta
New York Entomol. Soc.	

Other Professional Service:

Symposium Organizer, Collecting abroad: Laws, permits, and experience based recommendations, Entomological Society of America, 2004.
Symposium Organizer, Insect Evolution in the age of genomics, Entomological Society of America, 2003.
Session Moderator, Phylogeny of Insect Orders, Dresden Germany, 2003.
Student Symposium Moderator, Hennig Society, 2001
Student Competition Judge, Entomological Society of America, 1999 -2000
Student Symposium Moderator, Entomological Society of America, 1998

Grants:

Testing the utility of mitochondrial genome rearrangements as phylogenetic markers in Ischnocera (Insecta: Phthiraptera). With Co-PI's S. L. Cameron and K. P. Johnson. Submitted to NSF Systematics. Awarded at \$300,000 over 3 years (2005-2008).

Structural reorganization of the hymenopteran mitochondrial genome. 2004. With Co-PI's M. Dowton, A. Austin, and M. Sharkey. Submitted to the Australian Research Council. Awarded at \$268,000 over 3 years (2005-2008)

REU Support for undergraduate students involved with research on insect phylogenomics. Submitted to NSF Research Experience for Undergraduates (Supplement to Current NSF Grants). (2004) Awarded at \$20,000 over 1 year.

REU Support for undergraduate students involved with research on phylogeny of fleas. January, 2003. NSF Research Experience for Undergraduates (Supplement to Current NSF Grants). Awarded at \$12,000 over 1 year (2004).

Phylogeny of Insects: Collaborative Approach. ORCA Environments for Mentoring Grant. Awarded January 2004 at \$20,000 over 1 year.

PEET: Building Taxonomic Expertise in Cucujoidea: Monographic and Phylogenetic Studies of the Cerylonid Beetles. Submitted to NSF Division of Environmental Biology. With Co-PI's J. M. McHugh and K. Miller. Awarded at \$800,000 over 5 years (2003-2007).

Request for Funding for field Work in India. BYU Kennedy Center. Funded at \$1,000 over 1 year. (2003).

Research Experience for Teachers (RET) Request for K12 teachers involved with research on insect phylogenomics. Submitted to NSF RET program (Supplement to Current NSF Grants). (2003) Awarded at \$20,000 over 1 year.

Supplemental Request for International Travel for CAREER: Familial Phylogeny of the Siphonaptera of the World. Submitted to NSF Systematics Panel, Division of Environmental Biology. Awarded at \$15,340 over

- 1 year (2003).
- Proposal To Fund Undergraduate Research in Borneo, Malaysia.* Submitted to Roger and Victoria Sant Educational Endowment, College of Biology and Agriculture, BYU. Awarded at \$10,000 over 1 year (2003)
- REU Support for undergraduate students involved with research on insect phylogenomics.* Submitted to NSF Research Experience for Undergraduates (Supplement to Current NSF Grants). Awarded at \$12,000 over 1 year (2002).
- Proposal To Fund Undergraduate Research in Namibia, South Africa.* Submitted to Roger and Victoria Sant Educational Endowment, College of Biology and Agriculture, BYU. Awarded at \$10,000 over 1 year. (2002)
- Proposal to Fund Undergraduate Research in Australia.* Submitted to Department of Integrative Biology. Awarded at \$3,000 over 1 year (2002).
- Dissertation Research: Phylogeny of Ephemeroptera -- Evolution of the subimago and nymphal gills with implications on the origin of flight.* Submitted to NSF Doctoral Dissertation Improvement Program for T. H. Ogden. Awarded at \$10,000 over 3 years. (2002-2004)
- Dissertation Research: A Molecular Phylogeny of Polyneoptera.* Submitted to NSF Doctoral Dissertation Improvement Program for M. D. Terry. Awarded at \$10,000 over 3 years (2002-2004).
- BIOCOMPLEXITY: Hexapod phylogenomics – Bringing phylogenetic supercomputing to the masses.* NSF Division of Environmental Biology. With Co-PIs M. J. Clement, K. A. Crandall, Q. Snell, and D. Whiting. Awarded at \$1,340,000 over 5 years (2002-2006).
- Request to Upgrade Sequencing Instrumentation, BYU DNA Sequencing Center.* Submitted to the Office of Research and Creative Activities, BYU. Funded at \$430,000 (2002).
- Origins of parasitism in the Psocodea.* Submitted to Australian Research Council. With Co-PIs S. Cameron, S. Barker, and K. Johnson. Funded at \$225,000 (Australian\$) over 3 years (2002-2004).
- Proposal To Fund Undergraduate Research in Papua New Guinea.* Submitted to Roger and Victoria Sant Educational Endowment, College of Biology and Agriculture, BYU. Awarded at \$10,000 over 1 year. (2001)
- Phylogeny of Insects: Request for Renewal.* Submitted to BYU ORCA Environments for Mentoring. Awarded at \$20,000 over 1 year. (2001)
- REU Support for undergraduate students involved with research on phylogeny of Hawaiian Carabid Beetles and fleas.* Submitted to NSF Research Experience for Undergraduates (Supplement to Current NSF Grants). Awarded at \$20,000 over 1 year.
- Phylogeny of Insects: A Comprehensive Approach.* Submitted to BYU ORCA Environments for Mentoring. Awarded at \$20,000 over 1 year. (2001)
- REU Support for undergraduate students involved with research on phylogeny of Hawaiian Carabid Beetles and fleas.* Submitted to NSF Research Experience for Undergraduates (Supplement to Current NSF Grants). Awarded at \$20,000 over 1 year. (2000)
- Phylogenetic Analysis: A Collaborative Approach.* Submitted to BYU ORCA and University Graduate Studies. With Co-PIs Q. Snell, M. Clement, K. A. Crandall, D. Whiting, and G. Fellingham. Awarded at \$150,000 over 3 years (2000-2002).
- NSF CAREER: Familial Phylogeny of the Siphonaptera of the World.* Submitted to NSF CAREER Program, Division of Environmental Biology. Awarded at \$500,000 over 5 years (2000-2004).
- REU Support for research on Mecopteran Phylogeny and Hawaiian Carabid Beetle Phylogeny.* Submitted to NSF Research Experience for Undergraduates (Supplement to Current NSF Grants). Awarded at \$10,000 over 1 year. (1999)
- Molecular Phylogenetics and Revisionary Systematics of the Hawaiian Carabid Beetles (Coleoptera: Carabidae).* With J. K. Liebherr. Submitted to NSF Systematics. Awarded at \$200,000 over 3 years (1998-2001).
- Phylogeny of the Mecoptera of the World based on Molecular and Morphological Data: Evidence for Two New Holometabolous Insect Orders .* With George Byers . Submitted to NSF Systematics. Awarded at \$100,000 over 3 years (1997-2000).
- Dissertation Research: Phylogeny of the Holometabolous insect orders based on molecular data.* NSF Dissertation Improvement Grant. Awarded at \$15,000 over 3 years (1991-1993).
- Request for preliminary funding for insect molecular systematics.* Department of Research, Cornell University. Awarded at \$4,000 over 1 year. (1991)

Invited Lectures:

- New York State Museum, Albany, NY. Invited Speaker. Feb. 2004.
Texas A&M University, Department of Entomology, Seminar Speaker; College Station, TX, Nov 2002.
Assembling the Tree of Life, American Museum of Natural History; New York, NY, June 2002.
Entomological Society of America Annual Meetings; San Diego, California, Dec. 2001.
Bay Area Systematics Group; Davis California, Nov. 2001.
University of California at Davis Seminar Speaker; Davis, California, Nov. 2001.
University of California at Riverside Seminar Speaker; Riverside, California, Nov. 2001.
New Directions in Cluster Supercomputing; American Museum of Natural History, June 2001.
XXI International Congress of Entomology; Iguassu Falls, Brazil, Aug. 2000.
Ohio State University Seminar Speaker; Columbus, Ohio, Feb. 1999.
University of Utah Seminar Speaker; Salt Lake City, Utah, Dec. 1998.
Conference of Italian Zoologists; Rimini Italy, Sep. 1997.
University of Georgia Seminar Speaker; Athens, Georgia, Aug. 1996.

Publications

Book Chapters

- Whiting, M. F. (2004). Phylogenetic position of Diptera: A review of the evidence. *The Evolutionary Biology of Flies* B.M. Wiegmann and D.K. Yeates, eds. Columbia University Press. (in press)
Whiting, M. F. (2004). Phylogeny of Holometabolous Insects: The most successful group of terrestrial organisms. Pp. 345-364. *Assembling the Tree of Life*. J. Cracraft and M. Donoghue eds. Oxford University Press
Hastriter, M. W. and M. F. Whiting. (2003). Siphonaptera (fleas). *Encyclopedia of Insects*. V. H. Resh and R. Carde eds. Academic Press 1040-1044.
Whiting, M. F. (2003). Strepsiptera. *Encyclopedia of Insects*. V. H. Resh and R. Carde eds. Academic Press (1094-1095).
Whiting, M. F. (2002). High throughput DNA sequencing for Systematic Applications. *Techniques in Molecular Systematics and Evolution*. R. DeSalle, G. Giribet, and W. C. Wheeler, eds. Birkhauser Press 328-350.
Whiting, M. F. (2002). Phylogeny of the holometabolous insect orders based on 18S ribosomal data: when bad things happen to good data. *Molecular Systematics and Evolution: Theory and Practice* R. DeSalle, G. Giribet and W. Wheeler eds. Birkhauser press. 69-84.

Journal Articles

- Terry, M. D., and M. F. Whiting. (2005). Behavior of POY versus CLUSTALL across a broad parameter landscape. *Cladistics* (in review).
Terry, M. D., and M. F. Whiting. (2005). Phylogeny of polyneopterous insect orders: Is Mantophasmatodea a new order? *Cladistics* (in review).
Dittmar, K., M. L. Porter, S. Murray, and M. F. Whiting. (2005). Phylogenetic relationships among the nycteribiid and streblid batflies (Diptera: Brachycera, Calyptratae). *Systematic Entomology* (submitted).
Ogden, T. H., J. T. Osborne, L. M. Jacobus, and M. F. Whiting. (2005). Combined molecular and morphological phylogeny of Ephemerebellidae (Ephemeroptera) and its position within Pannota. *Systematic Entomology* (submitted)
Ogden, H., M. F. Whiting, and W. Wheeler. (2004). Poor Taxon Sampling, Poor Character Sampling, and Non-Repeatable Analyses of a Contrived Dataset do not Provide a More Credible Estimate of Insect Phylogeny: A Reply to Kjer. *Systematic Biology* (in review).
Terry, M. D., and M. F. Whiting. (2004). Phylogeny of the genus Isogenoides (Plecoptera: Perlodidae) and the evolution of drumming behavior. *Evolution* (in review).
Terry, M. D., and M. F. Whiting. (2004). Phylogenetic Systematics of Plecoptera: Evidence from morphology and six genes. *Systematic Entomology* (in review)
Dittmar de la Cruz, K. A. M. Jansen, S. Mendonca de Souza, L. F. Ferreira, K. J. Reinhard, M. F. Whiting, and A. Araujo. 2005. An interesting case of Chagas' disease in Central Brazil. *Lancet* (in review).
Taylor, S. D., K. Dittmar de la Cruz, M. L. Porter, and M. F. Whiting. (2005). Characterization of the long-wavelength opsin from Mecoptera and Siphonaptera: Does a flea see? *Molecular Biology and Evolution* (in press)
Ogden, T. H. and M. F. Whiting. (2004). Phylogeny of Ephemeroptera (mayflies) based on molecular evidence. *Molecular Phylogenetic and Evolution* (in press).

- K. Dittmar, M. L. Porter, L. Price, G. Svenson, and M. F. Whiting. (2004). Invertebrates of caves of peninsular Malaysia. *Malaysian Nature Journal* (in press)
- Jarvis, K. J., F. Haas, and M. F. Whiting. (2004). A phylogeny of Dermaptera (Insecta) based on molecular and morphological evidence: reconsidering the classification of earwigs. *Systematic Entomology* (in press).
- Hastriter, M.W. and M.F. Whiting. (2004) Records of fleas (Siphonaptera) of carnivores from Idaho. *Proceedings of the Entomological Society of Washington* (in press).
- Cameron, S. L., K. B. Millar, C. A. D’Hease, M. F. Whiting, and S. C. Barker. (2004). Mitochondrial genome data alone is not enough to unambiguously resolve the relationships of Entognatha, Insecta and Crustacea *sensu lato* (Arthropoda). *Cladistics* 20:534-537.
- Hastriter, M.W., K. Frafjord, and M.F. Whiting. 2004. A collection of Norwegian fleas (Siphonaptera) north of the Arctic Circle. *Proceedings of the Entomological Society of Washington* 106: 876-882.
- Dittmar K, and M. F. Whiting (2004): New *Wolbachia* endosymbionts from nearctic and neotropical fleas (Siphonaptera). *Journal of Parasitology* 90: 953-957.
- Cryan, J. R., B. M. Wiegmann, L. L. Dietz, C. H. Dietrich, and M. F. Whiting. (2004). Treehopper trees: Phylogeny of Membracidae (Hemiptera: Cicadomorpha: Membracoidea) Based on Molecules and Morphology. *Systematic Entomology* 29: 441-454.
- 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.
- Robertson, J. A., J. V. McHugh, and M. F. Whiting. (2004). A molecular phylogenetic analysis of the pleasing fungus beetles (Coleoptera: Erotylidae): evolution of colour patterns, gregariousness, and mycophagy. *Systematic Entomology* 29:173-187.
- Bybee, S., S. Taylor, C.R. Nelson, and M.F. Whiting. (2004). A Phylogeny of Robberflies (Diptera: Asilidae) at the subfamilial level: Molecular Evidence. *Molecular Phylogenetics and Evolution* 30:789-797.
- Whiting, M. F. and A. S. Whiting. (2004). Is wing recurrence *really* impossible?: a reply to Trueman et al. *Systematic Entomology* 29:140-141.
- Dittmar de la Cruz, K. and M. F. Whiting. (2003). Genetic and phylogeographic structure of populations of *Pulex simulans* (Siphonaptera) from domesticated guinea pigs (*Cavia aperea* f. *porcellus*) in Peru inferred from two genes (Cyt B and Co II). *Parasitol. Res* 91:55-59.
- Ogden, T. H. and M. F. Whiting. (2003). The problem with the “Paleoptera Problem”: Sense and sensitivity. *Cladistics* 19:432-442.
- Whiting, M. F., S. Bradler, and T. Maxwell. (2003). Loss and recovery of wings in stick insects. *Nature* 421:264-267.
- Barker, S. C., M. F. Whiting, K. P. Johnson, and A. Murrell. (2003). Phylogeny of the lice (Insecta: Phthiraptera) inferred from small subunit rRNA. *Zoologica Scripta* 32:407-414.
- Dittmar, K., U. Mamat, M. Whiting, T. Goldmann, K. Reinhard, and S. Guillen. (2003). Techniques of DNA-studies on prehispanic ectoparasites (*Pulex* sp., Pulicidae, Siphonaptera) from animal mummies of the Chiribaya culture, Southern Peru. *Mem. Inst. Oswaldo Cruz, Rio De Janeiro*, 98:53-58.
- Hastriter, M. W. , M. D. Zyzak, R. Soto, R. Fernandez, N. Solorzano, and M. F. Whiting. (2002). Fleas (Siphonaptera) from Ancash Department, Peru, with the description of a new species, *Ectinorus alejo* (Rhopalopsyllidae), and the description of the male of *Plocopsylla pallas* (Rothschild, 1914) (Stephanocircidae) *Annals of the Carnegie*. 71: 87-106.
- Hastriter, M. W. and M. F. Whiting. (2002). *Macropsylla novaehollandiae* (Hystrichopsyllidae), a new species of flea from Tasmania. *Proc. Entomol. Soc. Washington* 104:663-671
- Whiting, M. F. (2002). Mecoptera is paraphyletic: multiple genes and phylogeny of Mecoptera and Siphonaptera. *Zoologica Scripta* 31: 93-105.
- Whiting, M. F. (2002). Phylogeny of the holometabolous insect orders: molecular evidence. *Zoologica Scripta* 31: 3-17.
- Whiting, M. F. (2002). XXI International Congress of Entomology, Iguassu Falls, Brazil, August, 2000. Phylogeny of Holometabola: state of the art. *Zoologica Scripta* 31:1-2.
- Johnson, K. P. and M. F. Whiting. (2001). Multiple genes and the phylogeny of Ischnocera (Insecta: Phthiraptera). *Molecular Phylogenetics and Evolution* 22:101-110.
- Cryan, J.R., J.K. Liebherr, J.W. Fetzner, Jr., and M.F. Whiting. (2001). Evaluation of relationships within the endemic Hawaiian Platynini (Coleoptera: Carabidae) based on molecular and morphological evidence. *Molecular Phylogenetics and Evolution* 21:72-85.
- Hastriter, M. W., M. E. Alarcon, and M. F. Whiting. (2001). A collection of fleas from the San Martin reserve, Valdivia Province, Chile. *Proc. Entomol. Soc. Wash.* 103: 437-443.
- Wheeler, W.C., M. F. Whiting, Q. D. Wheeler, and J. Carpenter. (2001). Phylogeny of the extant hexapod orders. *Cladistics* 17: 1-89.

- Snell, Q., M. Whiting, M. Clement, and D. McLaughlin. (2000). Parallel Phylogenetic Inference. *Proceedings of Supercomputing 2000*. Dallas, TX.
- Clement, M., Q. Snell, M. Whiting, and G. Judd. (1999). High performance phylogenetic inference. *Proceedings of the Eighth IEEE International Symposium on High Performance Distributed Computing (HPDC-8)*, Redondo Beach, California, August 3-6 1999, pp. 335-336.
- Whiting, M. F. (1998). Long Branch Distraction and the Strepsiptera. *Systematic Biology* 47:134-138.
- Siddall, M. E. and M. F. Whiting. (1998). Long branch abstractions. *Cladistics* 15: 9-24.
- Whiting, M. F. (1998). Phylogenetic position of Strepsiptera: Review of molecular and morphological evidence. *Int. J. Insect Morphol. & Embryol.* 27:53-60.
- Whiting, M. F., J. M. Carpenter, Q. D. Wheeler, and W. C. Wheeler (1997). The Strepsiptera problem: Phylogeny of the holometabolous insect orders inferred from 18S and 28S ribosomal DNA sequences and morphology. *Systematic Biology* 46:1-68.
- DeSalle, R., B. Perez-Sweeney, M. F. Whiting, D. Agosti, R. Bang, J. Remsen, and J. Bonacum. (1996) Crossroads, Milestones and Landmarks in Insect Development and Evolution: Implications for Systematics. *Aliso* 14:305-321.
- Whiting, M. F. and J. Kathirithamby (1995). Strepsiptera do not share hind-wing venational synapomorphies with the Coleoptera: a reply to Kukalova-Peck. *J. New York Entomol. Soc.* 103:1-14.
- Whiting, M. F. and L. Kelly (1995). Monophyly, plesiomorphy, and hierarchy: a reply to Wilkinson. *Acta Biotheoretica* 43:249-257.
- Whiting, M. F. and W. C. Wheeler (1994) Insect homeotic transformation. *Nature*, 368: 696.
- Whiting, M. F. (1994) Cladistic analysis of the alderflies North of Mexico (Megaloptera: Sialidae). *Systematic Entomology*, 19: 77-91.
- Meier, R. and M. F. Whiting (1992) Hennig86 and PAUP are reliable: A reply to Lorenzen and Sieg. *Z. zool. Syst. Evolut.-forsch.* 30: 239-243.
- Whiting, M. F. (1991) A new species of *Sialis* from Southern California (Megaloptera: Sialidae). *Great Basin Naturalist*, 51: 411-413.
- Whiting, M. F. (1991) Scanning electron microscopic study of the male genitalia of the North American alderfly genus *Sialis* (Megaloptera: Sialidae). *Great Basin Naturalist*, 51: 404-410.
- Whiting, M. F. (1991). A distributional study of *Sialis* (Megaloptera: Sialidae) in North America. *Entomological News*, 102: 50-57.