

CURRICULUM VITAE

DANIEL P. MOLLOY, Ph.D.



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CAREER BIOGRAPHY:

New York Times Science Section: *Science Takes on a Silent Invader*. February 24, 2014. ([Available online.](#))

CONSULTING PROJECTS: ([Available online.](#))

Specializing in the development of credible prevention, detection, rapid response, and eradication/control programs for aquatic invasive species, especially zebra and quagga mussels

RESEARCH INTERESTS:

Investigating the biology, ecology, and control of aquatic invasive species, especially zebra and quagga mussels; infectious diseases of aquatic invertebrates; evaluation of parasites and pathogens as biocontrol agents of pest aquatic invertebrates

MAJOR RESEARCH SUCCESSES: ([Available online.](#))

- The Patent Inventor of the biological control method now being commercialized exclusively by Marrone Bio Innovations® under the product name [Zequanox®](#) -- the first green biopesticide for the control of zebra/quagga mussels.
- A key research leader in North America whose pioneering laboratory and field trials with *Bacillus thuringiensis israelensis* (*Bt*) led to the commercialization of this bacterium by Valent BioSciences® under the product name [VectoBac®](#) -- the first green biopesticide for the control of black flies.

EDUCATION:

Ph.D. Entomology - State University of New York at Syracuse (1977)

M.S. Biology - Fordham University (1971)

B.S. Biology - Fordham University (1969)

PROFESSIONAL APPOINTMENTS:

- 2011- Present
- Adjunct Professor - Great Lakes Center, SUNY Buffalo State
 - Affiliate Scientist - Aquatic Invasive Species Specialist, Illinois Natural History Survey
 - Adjunct Professor - State University of New York at Albany
 - Principal and Managing Director, Molloy and Associates Consulting, LLC
 - Museum Scientist Emeritus, New York State Museum
- 1976 - 2011
- Founder & Director, New York State Museum Cambridge Field Research Laboratory

HONORS/AWARDS:

2014 Science Council Lecturer, Fordham University, New York City, NY ([Available online.](#))

1998 Environmental Award for Increasing Public Understanding. Museum of the Hudson Highlands, Cornwall, NY.

1972 Presidential Citation for Environmental Action. Environmental Protection Agency, Washington, DC.

PATENTS:

Molloy, D. P. 2001. A Method for Controlling *Dreissena* Species. United States Patent and Trademark Office, U. S. Department of Commerce. Patent No. 6,194,194. (Filed December 17, 1997 & issued February 27, 2001.) 4 pp. ([Available online.](#))

Molloy, D. P. 2004. A Method for Controlling *Dreissena* Species. Canadian Intellectual Property Office, Industry Canada. Patent No. 2,225,436. (Filed December 22, 1997 & issued December 21, 2004.) 13 pp. ([Available online.](#))

RESEARCH GRANTS RECEIVED AS PRINCIPAL INVESTIGATOR:

Directed 42 research projects totaling over 5 million dollars (those in last 5 years listed below).

A Color Test Strip Protocol for Identifying Live Dreissenid Mussels. U. S. Fish and Wildlife Service. \$58,025

Safe Dreissena Control: Promise for Unionid Restoration. U. S. Environmental Protection Agency – Great Lakes Restoration Fund. \$999,996.

Commercialization of an Innovative Green Technology for Controlling Zebra Mussels. National Science Foundation subaward through Marrone Organic Innovations. \$275,000.

Susceptibility of Zebra and Quagga Mussel Veligers to Control with Bacteria. U.S. Bureau of Reclamation. \$100,000.

Field Testing of Bacteria for the Control of Quagga Mussels in the Western United States. U.S. Bureau of Reclamation. \$20,000.

A Rapid Molecular Method for Detecting Parasites of Zebra and Quagga Mussels. U.S. Bureau of Reclamation. \$30,000.

Environmentally Safe Control of Zebra Mussel Fouling. U.S. Department of Energy National Energy Technology Laboratory. \$1,160,688.

PUBLICATIONS:

A list of all 88 publications is [available online](#). Grouped by topic, below are some selected publications over approximately the last 20 years.

Description of New Species of Parasites/Pathogens

New watermold parasites of rotifers	Molloy, D. P. , Glockling, S. L., Siegfried, C. A., Beakes, G. W., James, T. Y., Mastitsky, S. E., Wurdak, E., Giamberini, L., Gaylo, M. J., and Nemeth, M. J. 2014. <i>Aquastella gen. nov.</i> : a new genus of saprolegniaceous oomycete rotifer parasites related to <i>Aphanomyces</i> , with unique sporangial outgrowths. <i>Fungal Biology</i> 118:544-558.
New haplosporidian parasite of zebra mussels	Molloy, D. P. , Giamberini, L., Stokes, N. A., Burreson, E. M., and Ovcharenko, M. A. 2012. <i>Haplosporidium raabei</i> n. sp. (Haplosporidia): A parasite of zebra mussels, <i>Dreissena polymorpha</i> (Pallas, 1771). <i>Parasitology</i> 139(4):463-477.
New ciliate parasite of zebra mussels	Molloy, D. P. , Lynn, D. H., and Giamberini, L. 2005. <i>Ophryoglena hemophaga</i> n. sp. (Ciliophora: Ophryoglenidae): A parasite of the digestive gland of zebra mussels <i>Dreissena polymorpha</i> . <i>Dis. Aquat. Org.</i> 65:237-243. (Also see: 2006. <i>Dis. Aquat. Org.</i> 70:181 and 2007. <i>Dis. Aquat. Org.</i> 77:259.)
New Ciliate parasite of black flies	Lynn, D. H., Molloy, D. , and LeBrun, R. 1981. <i>Tetrahymena rotunda</i> sp. n. (Hymenostomatida: Tetrahymenidae), a ciliate parasite of the hemolymph of Simulium (Diptera: Simuliidae). <i>Trans. Am. Microsc. Soc.</i> 100(2):134-141.
New nematode parasite of black flies	Molloy, D. 1979. Description and bionomics of <i>Mesomermis camdenensis</i> n. sp. (Mermithidae), a parasite of black flies (Simuliidae). <i>J. Nematol.</i> 11(4):321-328.

Parasite/Pathogen Biology and Ecology

Bacterial pathogens of dreissenid mussels	Molloy, D. P. , Mayer, D. A., Giamberini, L., and Gaylo, M. J. 2013. Mode of action of <i>Pseudomonas fluorescens</i> strain CL145A, a lethal control agent of dreissenid mussels (Bivalvia: Dreissenidae). <i>J. Invertebr. Pathol.</i> 113(1):115-121.
Range of parasites in dreissenids	Minguez, L., Devin, S., Molloy, D. P. , Guérol, F., and Giambérini, L. 2013. Occurrence of zebra mussel parasites: Modelling according to contamination in France and the USA. <i>Environ. Pollut.</i> 176:261-266.
Range of parasites in dreissenids	Molloy, D. P. , Giamberini, L., Burlakova, L. E., Karatayev, A. Y., Cryan, J. R., Trajanovski, S. L., and Trajanovska, S. P. 2010. Investigation of the endosymbionts of <i>Dreissena stankovici</i> with morphological and molecular confirmation of host species. Pages 227-237 in <i>The Zebra Mussels in Europe</i> (Van der Velde, G., Rajagopal, S., and Bij de Vaate, A., eds.). Backhuys Publishers, Leiden.
Range of parasites in dreissenids	Minguez, L., Molloy, D. P. , Guérol, F., and Giambérini, L. 2011. Zebra mussel (<i>Dreissena polymorpha</i>) parasites: Potentially useful bioindicators of freshwater quality? <i>Water Res.</i> 45:665-673.
Range of parasites in dreissenids	Mastitsky, S. E., Karatayev, A. Y., Burlakova, L. E., and Molloy, D. P. 2010. Parasites of exotic species in invaded areas: Does lower diversity mean lower epizootic impact? <i>Divers. Distrib.</i> 16:798–803.

Range of parasites in dreissenids	Minguez, L., Meyer, A., Molloy, D. P. , and Giambérini, L. 2009. Interactions between parasitism and biological responses in zebra mussels (<i>Dreissena polymorpha</i>): Importance in ecotoxicological studies. <i>Environ. Res.</i> 109:843-850.
Ciliate parasites in dreissenids	Karatayev, A. Y., Burlakova, L. E., Molloy, D. P. , and Mastitsky, S. E. 2007. <i>Dreissena polymorpha</i> and <i>Conchophthirus acuminatus</i> : What can we learn from host-commensal relationships? <i>J. Shellfish Res.</i> 26(4):1153-1160.
Ciliate parasites in dreissenids	Karatayev, A. Y., Mastitsky, S. E., Molloy, D. P. , and Burlakova, L. E. 2003. Patterns of emergence and survival of <i>Conchophthirus acuminatus</i> (Ciliophora: Conchophthiridae) from <i>Dreissena polymorpha</i> (Bivalvia: Dreissenidae). <i>J. Shellfish Res.</i> 22:495-500.
Trematode parasites in dreissenids	Petkevičiūtė, R., Stanevičiūtė, G., and Molloy, D. P. 2003. Chromosome analysis of <i>Phyllodistomum folium</i> (Trematoda, Gorgoderidae) infecting three European populations of zebra mussels. <i>Parasitol. Res.</i> 90:377-382.
Ciliate parasites and nematodes in dreissenids	Karatayev, A. Y., Mastitsky, S. E., Burlakova, L. E., Molloy, D. P. , and Vezhnovets, G. G. 2003. Seasonal dynamics of endosymbiotic ciliates and nematodes in <i>Dreissena polymorpha</i> . <i>J. Invertebr. Pathol.</i> 83:73-82.
Bacteria in ciliates parasites of dreissenids	Fokin, S. I., Giamberini, L., Molloy, D. P. , and bij de Vaate, A. 2003. Bacterial endocytobionts within endosymbiotic ciliates in <i>Dreissena polymorpha</i> (Lamellibranchia: Mollusca). <i>Acta Protozool.</i> 42:31-39.
Trematode parasites in dreissenids	Laruelle, F., Molloy, D. P. , and Roitman, V. A. 2002. Histological analysis of trematodes in <i>Dreissena polymorpha</i> : Their location, pathogenicity, and distinguishing morphological characteristics. <i>J. Parasitol.</i> 88(5):856-863.
Ciliates parasites in dreissenids	Karatayev, A. Y., Burlakova, L. E., Molloy, D. P. , Volkova, L. K., and Volosyuk, V. V. 2002. Field and laboratory studies of <i>Ophryoglena</i> sp. (Ciliata: Ophryoglenidae) infection in zebra mussels, <i>Dreissena polymorpha</i> (Bivalvia: Dreissenidae). <i>J. Invertebr. Pathol.</i> 79:80-85.
Intracytoplasmic prokaryotes in dreissenids	Molloy, D. P. , Giamberini, L., Morado, J. F., Fokin, S. I., and Laruelle, F. 2001. Characterization of intracytoplasmic prokaryote infections in <i>Dreissena</i> sp. (Bivalvia: Dreissenidae). <i>Dis. Aquat. Org.</i> 44(3):203-216.
Ciliate parasites in dreissenids	Karatayev, A. Y., Molloy, D. P. , and Burlakova, L. E. 2000. Seasonal dynamics of <i>Conchophthirus acuminatus</i> (Ciliophora, Conchophthiridae) infection in <i>Dreissena polymorpha</i> and <i>D. bugensis</i> (Bivalvia: Dreissenidae). <i>Eur. J. Protistol.</i> 36:397-404.
Range of parasites in dreissenids	Karatayev, A. Y., Burlakova, L. E., Molloy, D. P. , and Volkova, L. K. 2000. Endosymbionts of <i>Dreissena polymorpha</i> (Pallas) in Belarus. <i>Int. Rev. Hydrobiol.</i> 85:539-555.
Ciliate parasites in dreissenids	Laruelle, F., Molloy, D. P. , Fokin, S. I., and Ovcharenko, M. A. 1999. Histological analysis of mantle-cavity ciliates in <i>Dreissena polymorpha</i> : Their location, symbiotic relationship, and distinguishing morphological characteristics. <i>J. Shellfish Res.</i> 18:251-257.
Nematode parasites in stoneflies	Molloy, D. P. , Vinikour, W. S., and Anderson, R. V. 1999. New North American records of aquatic insects as paratenic hosts of <i>Pheromermis</i> (Nematoda: Mermithidae). <i>J. Invertebr. Pathol.</i> 72:89-95.
Ciliate parasites in dreissenids	Burlakova, L. E., Karatayev, A. Y., and Molloy, D. P. 1998. Field and laboratory studies of zebra mussel (<i>Dreissena polymorpha</i>) infection by the ciliate <i>Conchophthirus acuminatus</i> in the Republic of Belarus. <i>J. Invertebr. Pathol.</i> 71:251-257

Development of Biological Control Agents of Aquatic Pest Invertebrates

Control of dreissenids	Molloy, D. P. , Mayer, D. A., Gaylo, M. J., Morse, J. T., Presti, K. T., Sawyko, P. M., Karatayev, A. Y., Burlakova, L. E., Laruelle, F., Nishikawa, K. C., Griffin, B. H. 2013. <i>Pseudomonas fluorescens</i> strain CL145A – A biopesticide for the control of zebra and quagga mussels (Bivalvia: Dreissenidae). <i>J. Invertebr. Pathol.</i> 113(1):104-114.
Control of dreissenids	Molloy, D. P. , Mayer, D. A., Gaylo, M. J., Burlakova, L. E., Karatayev, A. Y., Presti, K. T., Sawyko, P. M., Morse, J. T., Paul, E. A. 2013. Non-target trials with <i>Pseudomonas fluorescens</i> strain CL145A, a lethal control agent of dreissenid mussels (Bivalvia: Dreissenidae). <i>Manag. Biol. Invasions</i> 4(1):71-79. (Available online.)
Control of dreissenids	Molloy, D. P. 2002. Biological control of zebra mussels. Pages 86-94 in <i>Proceedings of the Third California Conference on Biological Control</i> . University of California, Davis.
Control of dreissenids	Molloy, D. P. 1998. The potential for using biological control technologies in the management of <i>Dreissena</i> spp. <i>J. Shellfish Res.</i> 17:177-183.

Aquatic Invasive Species Biology, Ecology and Distribution

Dreissenid species invades France	Marescaux, J., Molloy, D. P. , Giamberini, L., Albrecht, C., and Van Doninck, K. 2012. First records of the quagga mussel, <i>Dreissena rostriformis bugensis</i> (Andrusov 1897), in the Meuse River within France. <i>BiolInvasions Records</i> 1(4):273–276. (Available online.)
Dreissenid species invades Western Europe	Molloy, D. P. , bij de Vaate, A., Wilke, T., and Giamberini, L. 2007. Discovery of <i>Dreissena rostriformis bugensis</i> (Andrusov 1897) in Western Europe. <i>Biol. Invasions</i> 9:871–874.

Molecular Techniques Related to Parasites

Are rDNA sequences changes by fixatives	Stunžėnas, V., Cryan, J. R., and Molloy, D. P. 2004. Comparison of rDNA sequences from colchicine treated and untreated sporocysts of <i>Phyllodistomum folium</i> and <i>Bucephalus polymorphus</i> (Digenea). <i>Parasitol. Int.</i> 53(3):223-228.
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Review of Natural Enemies of a Pest Aquatic Invertebrates

Natural enemies of dreissenids	Molloy, D. P. , Karatayev, A. Y., Burlakova, L. E., Kurandina, D. P., and Laruelle, F. 1997. Natural enemies of zebra mussels: Predators, parasites, and ecological competitors. <i>Rev. Fisheries Sci.</i> 5(1):27-97.
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PROFESSIONAL PRESENTATIONS:

Over 200 scientific seminars, lectures, panel discussions, and workshops ([Available online.](#))

INTERNATIONAL TRAVEL FOR COLLABORATIVE RESEARCH:

Belarus:	1994 - 1997 (4 weeks)
Cameroon:	1988 (1 week)
France:	1994 - 2012 (61 weeks)
Germany:	2006 - 2009 (2 weeks)
Greece:	2003 (1 week)
Ireland:	2004 - 2006 (2 weeks)
Ivory Coast:	1988 (1 week)
Liberia:	1988 (1 week)
Lithuania:	2001 (2 weeks)
Mali:	1988 (1 week)
Netherlands:	1992 - 2007 (4 weeks)
Republic Macedonia:	2003 - 2006 (5 weeks)
Russia:	1993 - 1995 (5 weeks)
Ukraine:	1994 (1 week)

FOREIGN LANGUAGES:

French:	Conversational
Russian:	Basic