Curriculum Vitae: Michael G. Hadfield

Education:

University of Washington, Seattle, A.B., l959, Zoology
University of Washington, Seattle, M.S., l96l, Zoology
University of Copenhagen, l96l l962, Marine Biology
Stanford University, California, Ph.D., l967, Biological Sciences

Fellowships:

Fulbright Fellow, l96l l962, Danish Marine Laboratory, University of Copenhagen.
NIH Predoctoral Fellow, l962 l966, Stanford University.

Positions:

Assistant Professor of Zoology, Pomona College, Claremont, California, 1966 1968.
Assistant Professor of Cytology and Zoology, Pacific Biomedical Research Center, University of Hawaii, l968 l975.
Associate Professor of Cytology and Zoology, Department of Zoology and Pacific Biomedical Research Center, University of Hawaii, l975 l979.
Professor of Cytology and Zoology, Department of Zoology and Pacific Biosciences Research Center, University of Hawaii, l979 -.
Director, Kewalo Marine Laboratory, Pacific Biosciences Research Center, University of Hawaii, 1996 - 2007.

Other Professional Experience and Activities:

Fulbright Fellow, Marine Laboratory, University of Copenhagen, studied marine invertebrate larvae with Prof. G. Thorson, l96l 62.
Participant, Stanford University "Te Vega" Expedition, Tropical Pacific, Summer l963.
Scientist, U.S. Antarctic Program Research Ship "Eltanin", Summer l964.
NSF Summer Institute, Chofu, Japan, Co teaching "Environmental Biology", Summer l97l.
Visiting Professor, Invertebrate Zoology: University of Washington, Friday Harbor Labs, Summer l981.
Visiting Professor, Advanced Invertebrate Embryology: Friday Harbor Laboratories, Universi-ty of Washington, l968, l978, 1983, 1988, 1994, 1998; Catalina Island Marine Biological Laboratory, May l97l.
Visiting Professor, Larval Ecology: University of Washington, Friday Harbor Lab, Spring, l984, 1986.
Visiting Professor, Cell Biology of Invertebrate Development: Hopkins Marine Station (Stan-ford Universi-ty), Summer 1989.
Visiting Professor, Invertebrate Life Histories: University of Guam Marine Laboratory, Summer l980, 1991, 1995.
Associate Editor, Pacific Science. 1985 – 2004.
Panelist, U. S. Department of Agriculture, Small Business Innovative Research Grants in Aqua-culture. 1990.
Member, Review Committee for Smithsonian Institution, National Museum of Natural Histo-ry; reviewing the Smithsonian Marine Station at Link Port, Florida. April 5-8, 1990.
Plenary Lecturer, Biology of Marine Larvae in: Biotechnology in Marine Biology, a short course sponsored by the Organization of American States, Santiago, Chile. Jan. 10-15, 1992.

Member, Animal Species Advisory Commission, State of Hawaii, appointed by Gov. John Waihee, 1988-93.
Member, National Science Foundation Task Group on Invertebrate Teaching, 1991-93.
Member, National Research Council Committee on Molecular Marine Biology, 1992-1993.
Participant, National Science Foundation, Division of Ocean Sciences, Workshop on Biological Diversity in Marine Systems (BioMar): A Proposed National Research Initiative. 1993.
Asso-ciate Editor, Journal of Experi-mental Zoolo-gy, 1990-1993.
Regional Editor, Marine Biology, International Journal on Life in Oceans and Coastal Wa-ters, 1988-1993
Workshop Participant, The roles of marine laboratories in the implementation of the nation s emerging priorities for research and monitoring in the coastal zone. Sponsored by the National Association of Marine Laboratories. 1995.
Visiting Committee, Department of Organismic and Evolutionary Biology, Harvard University, 1991-1996.
Natural Area Reserves Commission, State of Hawaii, 1992-96, Chair, 1993-96.
Member, National Research Council, Working Group on New Models for Biomedical Research, 1997.
Ballast-water Task Force, Hawaii Departments of Land and Natural Resources and Agriculture, 1997- 99.
Ad hoc committee on governance, Society for Integrative and Comparative Biology, 1999.
International Workshop on the Census of Marine Live, Heraklion, Crete, Nov. 2000.
Chair, Search Committee for Head of Department of Invertebrate Zoology, U.S. National Museum of Natural History, Smithsonian Institution, 2000.
Chair, Search Committee for Director, the Smithsonian Marine Station, Smithsonian Institution, U.S. National Museum of Natural History, 2001.

Current:

Research Associate, Bernice P. Bishop Museum, 1983 -.
Research Associate, Museum of Comparative Zoology, Harvard University, 1994 - .
Member, Mollusc Specialist Group, Species Survival Commission, International Union for The World Conservation Union, 1985 -.
Secretary-Treasurer, Western Association of Marine Laboratories, 1998 -.
Member. Hawaii State Alien Aquatic Species Taskforce, 2002 -.
Board of Directors, Pacific Institutes of Marine Science (International), 2002; President 2007 - 2008.
Member, Scientific Advisory Board: Biodiversity Research Center, Academia Sinica, Taipei, Taiwan, 2008 -.

Membership in Professional Societies:

American Association for the Advancement of Science; American Institute of Biological Sciences; American Malacological Society; American Microscopical Society; International Society on Invertebrate Reproduction and Development; Malacological Society of London; Sigma Xi; Society for Integrative and Comparative Biology; Unitas Malacologica; Western Society of Naturalists.

Offices:

Conservation Council for Hawaii (affil. Nat. Wildlife Fed.), Oahu Chapter: President, 1981-82.
Society of Sigma Xi, Hawaii Chapter: Councilor, 1989-90, President, 1991-92.
Western Society of Naturalists: President, 1993.
American Society of Zoologists, Division of Invertebrate Zoology: Chairman 1991 and 1992.
Society for Integrative & Comparative Biology (formerly American Society of Zoologists): President, 1995 and 1996; Executive Committee, 1991 - 1998.

Hawaii Academy of Science. President, 2004 – 2005.
Pacific Institutes of Marine Science. President, 2007 – 2009.

Honors:

Fellow, American Association for the Advancement of Science.
Matsuda Scholar, University of Hawaii, 1989-90.

Research Interests:

Settlement and metamorphosis of marine invertebrate larvae; comparative life history studies; chemical interactions in marine animals; marine biofilm bacteria; evolu-tionary and conservation biology of Hawaiian tree snails.-

Current Extramural Grant Support:

U. S. Fish and Wildlife Service. 2001-2013. Conservation biology of Hawaiian tree snails. Five years, funded annually at $90,000 per year.
National Science Foundation – URM: Environmental Biology in the Pacific Islands. 2008 – 2013. $995,379. Lead P.I.
Office of Naval Research. 2008 – 2011. Multiple approaches for testing novel coatings in the laboratory and in Pearl Harbor: Hawaii: investigations at the microbial and macrofouler levels. $674,966.
Office of Naval Research. 2008 - 2011. Developing cDNA libraries of receptors involved in the recruitment of the biofouling tubeworm *Hydroides elegans*. $101,847.
National Science Foundation. 2009 – 2012. Larva-environment interactions: how settlement of marine larvae depends on their responses to varying water flow and surfaces. $304,689.

Invited Symposium and Seminar Lectures:

1970. Western Society of Naturalists. Symposium on Reproduction and Development of Marine Invertebrates. Honolulu. J. S. Pearse, organizer.
1974. University of Guam and Western Society of Naturalists. International Conference on Coral Reefs: Animal associates of corals. Agana, Guam. L. Eldredge, organizer.
1975. Gordon Conference on Marine Natural Products Chemistry, Santa Barbara. P. J. Scheuer, organizer.
1976. NATO Conference Series in Marine Sciences: Marine Natural Products Chemistry. Jersey, U.K., D. J. Faulkner and W. H. Fenical, organizers.
1977. Belle W. Baruch Conference in Marine Science: Reproductive Ecology of Marine Inverte-brates. Baruch Institute, University of South Carolina. S. Stancyk, organizer.
1977. American Society of Zoologists. Symposium on Settlement and Metamorphosis of Marine Inver-tebrates. Toronto. F. S. Chia and M. E. Rice, organizers. (two papers presented)
1978. Western Society of Naturalists. Symposium on Recent Advances in Developmental Biology of Marine Invertebrates. Tacoma, WA. D. Epel, organizer.
1979. American Society of Zoologists. Symposium on Life History Strategies of Marine Organ-isms. Tampa. S. Woodin, organizer.
1982. U.S. Sea Grant Program. International Conference on Recent Innovations in Cultivation of Pacific Molluscs. La Jolla. D. E. Morse, K. Chew, and R. Mann, organizers.
1983. American Malacological Union. Symposium on Extinction in Molluscs. Seattle. G. Verm-eij, orga-nizer.
1984. Gordon Conference on Marine Natural Products Chemistry. Santa Barbara. J. Sims, organizer.

1984. Tokai University Marine Science Center and Western Society of Naturalists. International Conference on Marine Plankton. Symposium on Factors Affecting Recruitment of Larvae from the Plankton. Shimizu, Japan. D. E. Morse, organizer.

1985. The Larval Biology Workshop. Friday Harbor, Washington. Member: Conven-ing Committee. Author: Summary paper on settlem-ent and recruitment.

1986. Symposium on the Biology of Opisthobranchia in Honor of Dr. Eveline D.R. Marcus. American Malacological Union. Monterey, CA. Dr. T. Gosliner, organizer.

1986. Symposium: "Molluscs as threatened species: their exploitation and conservation." International Malacological Union, Edinburgh, Scotland. Dr. E. A. Kay, convener.

1987. Donald P. Abbott Memorial Symposium on Marine Biology. Member of the Organizing, Committee. Asilomar, California.

1988. Symposium: "Chemical factors that influence the settlement and metamorphosis of marine invertebrate larvae." Co-chairman and participant. American Society of Zoologists. Dec. 1988, San Francisco, California.

1989. Symposium: "Mechanisms of reproduction in marine invertebrates." Co-convener and articipant. International Society for Invertebrate Reproduction. Nagoya, Japan. July 24-29, 1989.

1989. Symposium/Workshop: "New Models for Aging Research." Invited speaker and partici-pant. National Institute on Aging, National Institutes of Health. Bethesda, MD December 5-6, 1990.

1990. Symposium: "Non-polluting anti-fouling biosurfaces." Invited paper. Office of Naval Research. Buffalo, New York. June 29-July 1, 1990.

1991. Pacific Science Congress; symposium on detrimental effects of introduced organisms. Hono--lulu. May 28 - June 2, 1991

1991. Society for the Study of Evolution; invited paper for a symposium on evolutionary biology of Hawaiian plants and animals. Hilo. July 28 - Aug. 3, 1991

1991. Symposium: "International Symposium on Marine Biofouling." Invited paper. Aurangabad, India. August 12 - 16, 1991.

1992. Symposium: "Marine Biotechnology." Invited lecture on "Progress in Anti-fouling." Santia-go, Chile. January 13, 1992.

1992. Symposium: "Indo-U. S. Conference on Recent Advances in Non-polluting Biofouling Research," Bangalore, India, July 1992.

1992. Symposium: Ecological Society of America. Invited paper, "Ecology and conservation of endemic Hawai`ian tree snails." Honolulu, HI. August 10, 1992.

1992. Symposium: "Gerontology of Fungi and Invertebrates," Gerontological Society of America Invited paper, "Flexible life-spans in sea slugs and sea hares." November 19, 1992.

1992. Symposium: American Society of Zoologists, "The Crisis in Invertebrate Conservation." Organizer and speaker. Vancouver, BC. December 1992.

1993. ONR, 3rd Annual Investigator's Meeting: Olfactory Discrimination Program. "Chemosensory pathways in an adult nudibranch gastropod." B. F. Murphy and M. G. Hadfield. St. Augus-tine, FL, April 1993.

1994. International *Partula* Workshop. London. Feb. 11-13, 1994.

1994. University of Washington: Dimensions of Invertebrate Biodiversity. Seattle, WA. March 1994.

1994. State of Hawaii: Habitat regeneration and restoration. Honolulu, HI. July 1994.

1994. Biotic and abiotic interactions during larval and adult stages of marine benthic invertebrates. Nice, France. September 18-24, 1994.

1995. Symposium on Sensory Ecology and Physiology of Zooplankton. Honolulu, HI. January 1995.

1995. American Malacological Union, Symposium on Molluscan Conservation. Hilo, HI June 1995. Symposium address: Conservation biology of Hawaiian tree snails.

1995. 5th International Polychaete Conference, Keynote Address. Qingdao, China. July 1995. Keynote address to the symposium, Polychaetes as model organisms in marine biofouling and pollution and research.

1995. The Larval Biology Meeting. Ft. Pierce, FL, August 1995. Settlement of *Hydroides elegans*: the role of bacteria.

1995. National Association of Marine Laboratories, Workshop on roles of coastal laboratories in the implementation of the nation's emerging priorities for research in the coastal zone. Invited chair: working session on Fostering development and implementation of interdisciplinary research.

1996. 8th International Coral Reef Symposium, Panama City, Panama, June 1996. Special symposium on Early development and larval biology of invertebrate coral reef organisms, invited paper: The settlement response to biofilms in the common tropical serpulid *Hydroides elegans*.

1996. International symposium: Settlement and Metamorphosis of Marine Invertebrate Larvae, Plymouth, UK, July 1996. The D. P. Wilson Memorial Lecture: Larval settlement and metamorphosis: past, present and future.

1996. American Association of Zoos and Aquaria, Honolulu, HI, Sept. 1996. Invited symposium address: The fate of endangered Hawaiian tree snails in the field and lab.

1997. Office of Naval Research, International Symposium: Emerging nonmetallic materials for the marine environment. Honolulu, March 1997. Keynote address: Surface-microbe-invertebrate interactions in marine biofouling.

1997. Society for Conservation Biology, Victoria, British Columbia, June 1997. Invited symposium address: Invasions and extinctions: Case histories from Hawaiian tree snails.

1997. Society for Conservation Biology, Victoria, BC, June 1997. Invited symposium address: Coastal disturbances and recruitment of benthic marine invertebrates: A future or present problem?

1997. International Society of Chemical Ecology, 14th Annual Meeting, Vancouver, BC. July 1997. Invited keynote address: Chemical interactions in invertebrate larval settlement.

1998. The Larval Biology Meetings, Melbourne, Australia. Jan. Evidence that the anterior sensory organ of a gastropod larva contains the receptor for an external metamorphic signal.

1998. Duke University Marine Laboratory, invited seminar, Mar. 25, Settlement signals: how invertebrate larvae detect and process them. Department of Zoology, Duke University, Durham, NC, March 26, Insular evolution, invasions, and extinctions: case histories from Hawaiian tree nails..

1999. Society for Integrative and Comparative Biology, Past Presidential Address, January 1999. "To save a snail ....," Denver, CO.

1999. 10th International Congress on Marine Biocorrosion and Biofouling, Keynote Address, Feb. 1999. Melbourne, Australia. Macrofouling Processes: settlement processes in the ubiquitous fouler *Hydroides elegans*.

1999. Harvard University, Department of Organismic and Evolutionary Biology, seminar, Feb. 25, 1999. Settlement Signals: How Invertebrate Larvae Detect and Process them.

1999. Marine Coatings Research Institute, Qingdao, China. Sept. 6-7, 1999. Three lectures on biofouling, anti-fouling technology, and marine models for biomedical research.

2000. University of California at San Diego. Department of Biology, invited seminar, March 2, 2000. "Insular evolution, invasions and extinctions: case histories from Hawaiian tree snails."

2000. Scripps Institution of Oceanography, La Jolla, CA, invited seminar, March 3, 2000. "Settlement Signals: how invertebrate larvae detect and process them."

2000. Invited symposium address, Recruitment of an invertebrate larva in response to a dissolved cue in wave-driven flow. The Larval Biology Meetings, Santa Cruz, CA, June 24 - 28, 2000.

2000. Invited symposium address, Larval behavior in response to a dissolved settlement cue aids recruitment on coral reefs. 9th International Coral Reef Symposium, Bali, Oct. 23, 2000.

2001. Invited symposium address: Metamorphic competence as a major adaptive convergence in marine invertebrate larvae." Society for Integrative & Comparative Biology, symposium on: Ontogenetic Strategies of Invertebrates in Aquatic Environments, Jan. 4, 2001.

2001. Invited research seminar, Factors influencing settlement of marine invertebrate larvae. Bodega Marine Laboratory, University of California at Davis, May 17, 2001.

2001. Invited Plenary Lecture, The capacity to metamorphose, metamorphic induction and mechanisms

of response in (at least some) invertebrate larvae. 9th International Congress on Invertebrate Reproduction and Development. Rhodes University, Grahamstown, South Africa. July 17, 2001.

2001. Invited symposium address: Contributions of *ex situ* propagation and molecular genetics to the conservation of Hawaiian tree snails. UCLA Biodiversity Conference 2001: Experimental Approaches to Conservation Biology. Los Angeles, CA. Sept. 11 - 14, 2001.

2001. Invited research seminar, Factors Affecting the Settlement and Metamorphosis of Marine Invertebrate Larvae: Data from the Field and Lab. Oregon Institute of Marine Biology, University of Oregon, Oct. 5, 2001.

2002. Two invited symposium talks for the Opening Ceremony of the Coastal Marine Laboratory at Hong Kong University of Science and Technology: Research Activities at the Kewalo Marine Laboratory, and Induction of Metamorphosis in Invertebrate Larvae by Dissolved Environmental Cues: Does it Work in Turbulent Moving Water? May 22 - 23, 2002.

2002. Invited research seminars, Induction of Metamorphosis in Invertebrate Larvae by Dissolved Environmental Cues: does it work in turbulent moving water? Issues in Biofouling Research. The Tropical Marine Science Institute, National University of Singapore, May 29, 30, 2002.

2002. 5th International Larval Biology Meeting. Vigo, Spain. Do settling larvae make mistakes? Sept. 18, 2002.

2002. Invited lecture. Life Histories of Marine Invertebrates - A Symposium in Honor of Mary E. Rice, Sponsored by the Smithsonian Institution. Fort Pierce Laboratory. November 14 and 15, 2002.

2002. Invited lecture, Hawaii State Foundation on Culture and the Arts: A scientist looks at art: dissecting, sorting and moralizing. October 19, 2002.

2003. Invited lectures (3), Autonomous University of Baja California, Mexico, March 24-28, 2003.

2003. Invited lecture, Department of Biology, San Diego State University, California, Mar. 27, 2003.

2003. Invited Plenary Lecture. Australian Marine Science Association, Brisbane. July 10, 2003.

2003. Invited lecture, Centennial Symposium, Friday Harbor Laboratories, University of Washington, August 26, 2003.

2003. Invited lecture, American Society of Microbiology, Special Symposium on Biofilms, Victoria, British Columbia, November 2003.

2004. Plenary Lecture (invited), International Larval Biology Conference, Hong Kong, June 2004.

2004. Invited Symposium talk, International Society for Microbial Ecology, Cancun, Mexico, August 2004.

2005. Invited symposium contribution. Symposium on Endemic Land Snails of the Pacific, American Malacological Society, Asilomar, California, June, 2005

2005. Invited symposium contribution: From development to extinction: molluscan neontology and paleontology. American Malacological Society, Asilomar, June 2005.

2005. Invited seminar-lecture, National Institute of Oceanography. Goa, India. August 2005.

2005. Invited departmental seminar. Department of Integrative Biology, University of California, Berkeley, California. November 2005.

2005. Invited seminar, Hopkins Marine Station of Stanford University, Pacific Grove, CA, November 2005.

2006. Invited seminar to the Department of Conservation, Newport, New Zealand, April 2006.

2006. Tribute (invited). Symposium honoring John S. Pearse, Univ. California Santa Cruz, June 2006.

2006. Plenary Lecture (invited). Symposium on Recent Advances in Marine Antifouling Technology, National Institute of Ocean Technology, Chennai, India. November 2006.

2006. Invited lecture, Biodiversity Centre, Singapore Department of National Parks. November 2006.

2007. Invited seminar and discussions with graduate students. Dept. of Biology, University of Southern California, Los Angeles, February 2007.

2007. Invited speaker and participant. NSF-National Evolutionary Synthesis Center, Catalysis

conference on Origin and Evolution of Chemoreception. Durham, NC, June 2007.

2008. Keynote speaker (invited), “Recruitment on Rocks, Reefs and Rafts: why invertebrate larvae settle when and where they do.” International Conference on Biofouling and Ballast Water Management. Goa, India. February 2008.

2008. Chair and speaker, symposium on Conservation Status of Hawaiian Native Land Snails, “The Conservation Status of Hawaii’s Severely Endangered Achatinelline Tree Snails.” AAAS Pacific Division, Waimea, HI. June 2008.

2009. Keynote speaker. Academia Sinica, Taipei, Taiwan. “Larval-substrate interaction in the settlement of marine invertebrate larvae and its significance for biofouling.” April 2009.

2009. Keynote speaker. Pacific Biosciences Annual Symposium, University of Hawaii. “Multiple approaches to conserving Hawaii’s severely endangered tree snails.” May 2009.

2009. Keynote speaker. Asia Pacific Association of Chemical Ecologists. Honolulu, HI. "Recruitment in the sea: why invertebrate larvae settle when and where they do?" October 2009.

Publications:

Hadfield, M. G. 1963. The biology of nudibranch larvae. Oikos, 14(1):85 95.

Hadfield, M. G. 1963. *Coryphella parva* n. sp., a new nudibranch from the Oresund. Vidensk. Medd. Dansk naturh. Foren. 125: 371 376.

Hadfield, M. G. 1964. Opisthobranchia: The veliger larvae of the Nudibranchia. Zooplan-kton Sheet No. 106. Fiches d'Ident-ificati-on, Conseil Intern. L'Explo-ration Mer. 2 pp.

Hadfield, M. G. and R. H. Karlson. 1969. Externally-induced metamorphosis in a marine gastro-pod. Amer. Zool. 9(4): 1122.

Hadfield, M. G. 1970. Observations on the anatomy and biology of two vermetid gastropods. The Veliger 12(3): 301 309.

Hadfield, M. G., E. A. Kay, M. U. Gillette, and M. G. Lloyd. 1972. The Vermetidae (Mollusca: Gastropoda) of the Hawaiian Islands. Marine Biology 12(1): 81 98.

Hadfield, M. G. 1974. Chapter 7, Hemichordata. Pp. 185 240, in: "Reproduction of Marine Invertebrates," A. C. Giese and J. S. Pearse, eds. Academic Press.

Bonar, D. B. and M. G. Hadfield. 1974. Metamorphosis of the marine gastropod *Phestilla sibog-ae*. I. Light and electron micro-scopic analysis of larval and meta-mor-phic stages. J. Exp. Mar. Biol. Ecol. 16: 1 29.

Hadfield, M. G. 1975. Continuous laboratory culture of two *Aplysia* species. (Progress in Mari-culture). Lab Animal 4(3): 17.

Hadfield, M. G. 1976. Molluscs associated with living tropical corals. Micronesica 12(1): 133 148.

Hadfield, M. G. 1977. Chemical interactions in larval settling of a marine gastropod. Pp. 403 4-13, in: "Ma-rine Natural Products Chemistry," D. J. Faulkner and W H. Fenical, eds., Plenum, N. Y.

Manen, C. A., M. G. Hadfield, and D. H. Russell. 1977. Polyamine biosynthesis and accumu-lation during the early development of the nudibranch, *Phestilla sibogae*. Develop. Biol. 57: 454 4-59.

Switzer Dunlap, M., and M. G. Hadfield. 1977. Observations on development, larval growth and metamorphosis of four species of Aplysiidae (Gastropoda, Opistho-branchia) in laboratory culture. J. Exp. Mar. Biol. Ecol. 29: 245 261.

Hadfield, M. G. 1978. Metamorphosis in marine molluscan larvae: an analysis of stimulus and response. Pp. 165 175, in: "Settlement and Metamorphosis of Marine Invertebrate Larvae," F. S. Chia and M. E. Rice, eds. Elsevier.

Hadfield, M. G. 1978. Growth and metamorphosis of planktonic larvae of *Ptychodera flava* (Hemi--chordata: Enteropneusta). Pp. 247 254, in: "Settlement and Metamorphosis of Marine Invertebrate Larvae," F. S. Chia and M. E. Rice, eds. Elsevier.

Hadfield, M. G. and L. S. Ciereszko. 1978. Action of cembranolides derived from octocorals on larvae

of the nudibranch *Phestilla sibogae*. Pp. 145 159, in: "Drugs and Food from the Sea," P. N. Kaul and C. J. Sinderman, eds. Univ. of Oklahoma Press, Norman.
Switzer Dunlap, M., and M. G. Hadfield. 1979. Reproductive patterns of Hawaiian aplysiid gastro-- pods. In: "Reproductive Ecology of Marine Invertebrates," S. Stancyk, ed., B. W. Baruch Library of Marine Sciences, Vol. 9: 199 210.
Hadfield, M. G. 1979. Aplacophora. Chapter 1. Pp. 1 25, in: "Reproduction of Marine Inverte-brates Vol. V," A. C. Giese and J. S. Pearse, eds. Academic Press.
Austin, W. C. and M. G. Hadfield. 1980. Ophiuroidea. Pp. 144 159, in: "Marine Invertebrates of California Shores," R. H. Morris and D. P. Abbott, eds. Stanford University Press.
Hadfield, M. G. and C. N. Hopper. 1980. Ecological and evolutionary significance of pelagic spermato-phores of vermetid gastropods. Marine Biology 57: 315 325.
Hadfield, M. G. and B. S. Mountain. 1981. A field study of a vanishing species, *Achatinella mustelina* (Gastropoda, Pulmonata), in the Waianae Mountains of Oahu. Pac. Sci. 34: 345-358.
Switzer Dunlap, M. F. and M. G. Hadfield. 1981. Laboratory culture of *Aplysia*. Pp. 199 216, in: "Marine Invertebrates, Laboratory Animal Management," R. E Hinegardner and R. Fay, eds. Natl. Acad. Sci.
Hadfield, M. G. and R. E. Young. 1983. Planctosphaera (Hemichordata: Enteropneusta) in the Pacific Ocean. Marine Biology 73: 151 153.
Hadfield, M. G. and M. F. Switzer Dunlap. 1984. Reproduction in Opisthobranchs. Pp. 209 350, in: "The Biology of Molluscs," K. Wilbur, ed. Academic Press, N.Y.
Hadfield, M. G. 1984. Settlement requirements of molluscan larvae: new data on chemical and genetic roles. Aquaculture 39: 283 298.
Kempf, S. C. and M. G. Hadfield. 1985. Planktotrophy in the lecithotrophic larvae of a nudi-branch, *Phestilla sibogae* (Gastropoda). Biol. Bull. 169: 119 130.
Hadfield, M. G. and D. Scheuer. 1985. Evidence for a soluble metamorphic inducer in *Phestilla*: ecological, chemical and biological data. Bull. Mar. Sci. 37(2): 556 566.
Hadfield, M. G. 1986. Extinction in Hawaiian Achatinelline snails. Malacologia, 27: 67 81.
Hadfield, M. G. 1986. Settlement and recruitment of marine inverte-brates: a perspective and some proposals. Bull. Mar. Sci. 39: 418-425.
Hirata, K. Y. and M. G. Hadfield. 1986. The role of choline in metamorphic induction of *Phestilla* (Gastropoda, Nudibranchia). J. Comp. Biochem. Physiol. 84C: 15-21.
Miller, S. E. and M. G. Hadfield. 1986. Ontogeny of phototaxis and metamorphic compe-tence in larvae of the nudibranch *Phestilla sibogae* Bergh (Gastro-poda: Opistho-branchia). J. Exp. Mar. Biol. Ecol. 96: 1 18.
Yool, A. J., S. M. Grau, M. G. Hadfield, R. A. Jensen, D. A. Markell and D. E. Morse. 1986. Excess potassium induces larval metamorphosis in four marine invertebrate species. Biol. Bull. 170: 255 266.
Hadfield, M. G. and S. E. Miller. 1987. On developmental patterns of opisthobranchs. Amer. Malac. Bull. 5: 197-214.
Safriel, U. N. and M. G. Hadfield. 1988. Sibling speciation by life-history divergence in *Dendro-poma* (Gas-tropo-da; Vermetidae). Biol. J. Linnean Soc. 35: 1-13.
Hadfield, M. G. and S. E. Miller. 1989. Demographic studies on Hawaii's en-dangered tree snails: *Partul-ina proxima*. Pacific Science 43: 1-16.
Hadfield, M. G. 1989. Latitude, juvenile size and fecundity in *Petaloconchus* (Gastropoda). Bull. Mar. Sci. 45(2): 369-376.
Hadfield, M. G. and D. K. Iaea. 1989. The velum of encapsulated veligers of *Petaloconchus* (Gastro-poda) and the problem of re-evolution of planktotrophic larvae. Bull. Mar. Sci. 45(2): 377-386.
Pennington, J. T. and M. G. Hadfield. 1989. Larvae of a nudibranch mollusc (*Phestilla sibogae*) metamor-phose when exposed to common organic solvents. Biol. Bull. 177: 350-355.
Pennington, J. T. and M. G. Hadfield. 1989. A simple, non-toxic method for decalcification of living invertebrate larvae. J. Exp. Mar. Biol. Ecol. 130: 1-7.

Woollacott, R. M. and M. G. Hadfield. 1989. Larva of the sponge *Dendrilla cactus* (Demo-spongiae: De-ndro-ceratida). Trans. Am. Microsc. Soc. 108: 410-413.
Hadfield, M. G., S. E. Miller and A. H. Carwile. 1989. Draft recovery plan for endangered O`ahu tree snails, Achatinella spp. (U. S. Fish and Wildlife Service)(published April, 1993). 64 pp.
Hadfield, M. G. and M. F. Strathmann. 1990. Heterostrophic shells and pelagic develop-ment in trochoideans: implications for classification, phylogeny and paleoecology. J. Molluscan Studies 56: 239-256.
Bieler, R. and M. G. Hadfield. 1990. Reproductive biology of the sessile gastropod *Vermicularia spirata* (Cerithioidea: Turritellidae). J. Molluscan Studies 56: 205-219.
Hadfield, M. G. and J. T. Pennington. 1990. The nature of the metamorphic signal and its internal trans-duction in larvae of the nudibranch *Phestilla sibogae*. Bull. Mar. Sci. 46(2): 455-464.
Miller, S. E. and M. G. Hadfield. 1990. Developmental arrest during larval life and life-span extension in a marine mollusc. Science 248: 356-358.
Hadfield, M. G. and M. F. Switzer-Dunlap. 1990. Environmental regulation of lifespan and reproduction in *Aplysia juliana*. Advances in Invertebrate Reproduction 5: 247-255.
Pires, A. and M. G. Hadfield. 1991. Oxidative breakdown products of catecholamines and hydro-gen peroxide induce partial meta-morphosis in the nudibranch *Phestilla sibogae* Bergh (Gas-tro-poda: Opisthobranc-hia). Biological Bulletin 180:310-317.
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Postdoctoral scholars sponsored: J. Timothy Pennington, Anthony Pires, Esther Leise, Bernhard Ruthensteiner, Bernard Murphy, Linda Walters, Dmitri Boudko, Eric Holm, Catherine Unabia, Robert Thacker, Dean Wendt, Kristian Parker, Brenden Holland, John Zardus, Cory Bishop, Megan Huggett. **Current Postdoctoral scholar:** Elizabeth Perotti.

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