

## Woods Hole Sea Grant: Aquaculture -- Mollusks

DGGE-based Detection Method for Quahog Parasite Unknown (QPX)  
Gast, R.J., E. Cushman, D.M. Moran, K.R. Uhlinger, D. Leavitt, and R. Smolowitz  
Diseases of Aquatic Organisms, Vol. 70, pp. 115-122, 2006 WHOI-R-06-003

Lethal Marine Snow: Pathogen of Bivalve Mollusc Concealed in Marine Aggregates  
Lyons, M.M., J.E. Ward, R. Smolowitz, K.R. Uhlinger, and R.J. Gast  
Limnol. Oceanogr., Vol. 50, No. 6, pp. 1983-1988, 2005 WHOI-R-05-003

Diseases, Pests, and Predators of Concern to New England Shellfish Growers  
Walton, W.

brochures, 2005 WHOI-H-05-002, 003, and 004

Also available as PDF files by clicking on the topic of interest: [diseases](#), [pests](#), [predators](#)

If you are a shellfish grower, harvester, or resource manager, you are well aware that diseases, pests, and predators are issues of concern to New England shellfish growers. Woods Hole Sea Grant and Cape Cod Cooperative Extension have teamed up to provide information on these topics in the form of three waterproof guides that can be used in the field. The information provided in the guides is designed to help you determine which issue(s) you are dealing with so that you can begin to find a solution, such as treatments, exclusion devices, alternative growing techniques, siting and planting techniques, and control measures.

Shellfish Aquaculture: Tools, Tips, and Techniques  
Walton, W. (ed.)

DVD, Approximately 2 hours, 2005 WHOI-V-05-004

This DVD provides an introduction to the types and methods of shellfish aquaculture used by shellfish farmers on Cape Cod, Massachusetts.

Featured techniques include counting shellfish (both juveniles and adults) and quantitatively assessing shellfish habitat. Additionally, behind-the-scenes visits to nursery and grow-out operations highlight innovations and tricks of the trade from Cape Cod shellfish farmers and shellfish officers.

Important Changes to the Federal Crop Insurance Program for Quahog Farmers  
Walton, W. and J. Gallons

Marine Extension Bulletin, 4 pp., 2004 WHOI-G-04-003

Also available online: [click here](#)

Some Liability Issues for Massachusetts Shellfish Farmers  
Walton, W. and S. Showalter

Marine Extension Bulletin, 4 pp., 2004 WHOI-G-04-002

Also available online: [click here](#)

Effects of Caging on Retention of Postlarval Soft-Shell Clams (*Mya arenaria*)

Gulmann, L.K., L.S. Mullineaux, and H.L. Hunt

Journal of Shellfish Research, Vol. 20, No. 1, pp. 135-142, 2001 WHOI-R-01-008

Identification of Proliferating Cells in Hard Clams

Hanselmann, R., R. Smolowitz, and D. Gibson

Biol. Bull., Vol. 199, pp. 199-200, 2000 WHOI-R-00-005

Conditions Affecting the Growth and Zoosporulation of the Protistan Parasite QPX in Culture

Brothers, C., E. Marks III, and R. Smolowitz

Biol. Bull., Vol. 199, pp. 200-201, 2000 WHOI-R-00-006

Shellfish Aquaculture in Massachusetts

*Helpful to educators and students*

Leavitt, D.F.

Focal Points, 4 pp., 2000 WHOI-G-00-002

Resuspension of Postlarval Soft-Shell Clams *Mya arenaria* through Disturbance by the Mud Snail *Ilyanassa obsoleta*

Dunn, R., L.S. Mullineaux, and S.W. Mills

Marine Ecology Progress Series, Vol. 180, pp. 223-232, 1999 WHOI-R-99-010

### Related Files

» [PDF: Diseases of Concern to New England Shellfish Growers](#)

» [PDF: Pests of Concern to New England Shellfish Growers](#)

» [PDF: Predators of Concern to New England Shellfish Growers](#)

Federal Crop Insurance for Massachusetts Quahog Farmers

*Helpful to educators and students*

Leavitt, D.F.

Focal Points, 2 pp., 1999 WHOI-G-99-001

Also available online: [click here](#)

Clam Tents: A New Approach to Soft-Shell Clam Culture and Management

*Helpful to educators and students*

Leavitt, D.F.

Marine Extension Bulletin, 4 pp., 1998 WHOI-G-98-006

Also available online: [click here](#)

Observations of a Protistan Disease Similar to QPX in *Mercenaria mercenaria* (Hard Clams) from the Coast of Massachusetts

Smolowitz, R., D. Leavitt, and F. Perkins

Journal of Invertebrate Pathology, Vol. 71, pp. 9-25, 1998 WHOI-R-98-001

During the summer and fall of 1995, in clam aquaculture leases at two locations on the coast of Massachusetts, significant mortalities were observed to occur primarily in 1.5 - 2 year old hard clams (*Mercenaria mercenaria*, quahog) planted in the leases. This paper addresses the examination of the hard clams and the parasite responsible for the high mortality.

The Barnstable Harbor Shellfish Recruitment Enhancement Project (BHSREP): A Final Report

Marcotti, T. and D.F. Leavitt

47 pp, \$3.00, 1997 WHOI-T-97-001

The Case of the Dying Quahogs: A Scientific Mystery Unfolds

*Helpful to educators and students*

Leavitt, D.F. and T.I. Crago

Nor'easter, Vol. 8, No. 1, pp. 12-15, 1996 WHOI-R-96-007

Raising Scallops with the Greatest of Es

*Helpful to educators and students*

Schwartz, M. and T.I. Crago

Nor'easter, Vol. 7, No. 2, pp. 20-27, 1995 RIU-R-95-010

Reversing the decline in water quality of the Westport River estuary has become a community mission, with students, businesses, and thousands of volunteers rallying to restore the scallop population as a way to draw attention and resources to the estuary's water quality problem.

Benthic Mariculture and Research Rig Developed for Diver Operation

Hampson, G.R., D.C. Rhoads, and D.W. Clark

Diving for Science...1989, Proceedings of the American Academy of Underwater Sciences, Ninth Annual Scientific Diving Symposium, Woods Hole, MA, pp. 113-117, 1989 WHOI-R-89-017

Shellfish Diseases: Current Concerns in the Northeast: Proceedings of a Sea Grant-supported Workshop Held at the Woods Hole

Oceanographic Institution on February 26, 1987

*Helpful to educators and students*

[Only available on loan from the National Sea Grant Library](#)

White, A.W.

Woods Hole Oceanographic Institution Technical Report No. WHOI-87-13, 38 pp., 1987 WHOI-W-87-001

Growth and Survival of Larvae of *Mercenaria mercenaria* (L.) and *Crassostrea virginica* (Gmelin) Relative to Broodstock Conditioning and Lipid Content of Eggs

Gallager, S.M. and R. Mann

Aquaculture, Vol. 56, pp. 105-121, 1986 WHOI-R-86-010

On the Selection of Aquaculture Species: A Case Study of Marine Molluscs

Mann, R.

Aquaculture, Vol. 39, pp. 345-353, 1984 WHOI-R-84-004

An overview of marine mollusc culture in the Pacific Ocean reveals a rich variety of species in culture, physical environments where culture is effected, and technological, social, and economic backgrounds of participating individuals. Despite this variety, a few basic criteria have, until recently, dictated which molluscan species are prime candidates for aquaculture. This paper illustrates how innovative thinking has influenced the historical development of mollusc culture and how advancing culture technology has influenced, and potentially will influence, the future choice of prime aquaculture species.

Bivalve Mollusc Hatcheries: A Critical Appraisal of their Development and a Review of their Potential Value in Enhancing the Fisheries of Developing Nations

Mann, R.

Memorias de la Asociacion Latinoamerica de Acuicultura, A.L.A., Vol. 5, pp. 97-105, 1983 WHOI-R-83-023

This paper reviews the historical development of marine bivalve mollusc culture and emphasizes hatchery development. A discussion is made of hatchery development and the applicability of this technology to present problems in bivalve aquaculture throughout the world.

The Role of Introduced Bivalve Mollusc Species in Mariculture

Mann, R.

J. World Maricul. Soc., Vol. 14, pp. 546-559, 1983 WHOI-R-83-025

Premeditated introductions of non-indigenous molluscan shellfish species have been important in establishing several substantial fisheries. For example, the North American fishery for *Crassostrea gigas* developed from active introductions that began in the early part of this century and continued until 1978. More recently, *C. gigas* has been introduced to many sites in Europe, South Africa, South America, the Mediterranean, and the Indian and Pacific Oceans. This paper provides a brief history of the movement of selected bivalve mollusc species around the world, a detailed listing of movements that have occurred between 1978-1983, and a discussion of future prospects and problems associated with continuing movement of bivalve species for culture purposes.

Public Health Aspects of the Culture of the Japanese Oyster *Crassostrea gigas* (Thunberg) in a Waste Recycling Aquaculture System

Mann, R. and R.E. Taylor

Aquaculture, Vol. 30, pp. 311-327, 1983 WHOI-R-83-001

Growth of the Bay Scallop, *Argopecten irradians*, in a Waste Recycling Aquaculture System

Mann, R. and R.E. Taylor Jr.

Aquaculture, Vol. 24, pp. 45-52, 1981 WHOI-R-81-001

Growth of the bay scallop *Argopecten irradians* in a pilot scale waste recycling aquaculture system was examined over a 32-week-period at 14°C. *A. irradians* increased from initial live and dry weights of 1.15 g and 0.043 g, respectively, to terminal values of 9.08 g and 0.599 g, respectively. This corresponds to instantaneous growth rates for live weight (G) and dry meat weight (M) of 0.009 and 0.013, respectively. High mortalities were evident towards the end of the experiment with a terminal value of 33% giving an instantaneous mortality rate (Z) value of 0.0016. In laboratory experiments of 12 weeks duration at 12, 15, 18 and 21°C juvenile *A. irradians* gave values of 0.01, 0.013, 0.018 and 0.016 for G; 0.015, 0.015, 0.016 and 0.013 for M; and 0.038, 0.038, 0.037 and 0.040 for Z at the respective temperatures. Shell deformities were evident in laboratory grown individuals. *A. irradians* exhibits specific growth rates comparable to or higher than those previously recorded for other bivalve species cultured in waste recycling systems; however, a considerable reduction in the presently high mortality rate will be required to make *A. irradians* a prime candidate for practical application.

The Effect of Temperature on Growth, Physiology, and Gametogenesis in the Manila Clam *Tapes philippinarum*

[Only available on loan from the National Sea Grant Library](#)

Mann, R.

1979 WHOI-R-79-003

Some Biochemical and Physiological Aspects of Growth and Gametogenesis in *Crassostrea gigas* and *Ostrea edulis* Grown at Sustained Elevated Temperatures

[Only available on loan from the National Sea Grant Library](#)

Mann, R.

1979 WHOI-R-79-002

Analysis of Methods for the Culture of *Crassostrea virginica* in New England

[Only available on loan from the National Sea Grant Library](#)

Matthiessen, G.C. and L.J. Smith

1979 WHOI-R-79-021

Growth of *Mytilus edulis* L. in a Waste Recycling Aquaculture System

Mann, R.

1978 WHOI-R-78-007

Growth of Six Species of Bivalve Molluscs in a Waste Recycling Aquaculture System

[Only available on loan from the National Sea Grant Library](#)

Mann, R. and J.H. Ryther

1977 WHOI-R-77-014

Bivalve Mollusc Culture in a Waste Recycling Aquaculture System

[Only available on loan from the National Sea Grant Library](#)

Ryther, J.H. and R. Mann

1977 WHOI-T-77-005

Food Chain Dynamics of Abalone in a Polyculture System

[Only available on loan from the National Sea Grant Library](#)

Tenore, K.R.

1976 WHOI-R-76-006

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