



NSW DEPARTMENT OF
PRIMARY INDUSTRIES

PROCEDURES FOR ROUTINE OYSTER SPAT SAMPLING

Introduction

Procedures to collect and fix spat or juvenile oysters for disease investigation are listed below. Demand for hatchery-produced oyster spat is increasing as more growers move from naturally caught spat to faster growing or disease resistant stock. Currently, there are more than a dozen nursery operators in New South Wales receiving spat from a number of different bivalve hatcheries, including interstate hatcheries under permits issued by NSW DPI.

Spat mortalities can occur, particularly at the time of transport to field nurseries, and are generally caused by environmental factors and/or disease. Regular sampling of spat is essential as it protects the interests of nursery operators and, more importantly, helps to detect diseases and prevent their translocation.

Spat are usually smaller than 1 mm when they are delivered from a hatchery to a nursery and are therefore very vulnerable. Hatcheries provide spat with stable food and water quality conditions. However, when spat are moved to field nurseries they are exposed to widely fluctuating and abrupt water quality changes for the first time in their lives.

Why do I need to sample spat?

Regular sampling of spat is very important. This provides nursery operators rearing hatchery spat with a record of spat health while they are in nursery systems. Should problems occur, a set of regular samples means that the cause or causes can be explored, which will assist in preventing future problems, and help guide management decisions.

It is also a permit requirement that “The permit holder shall notify the Department within 24 hours of the discovery of any declared disease, unusual disease or any significant

event associated with the welfare of the fish (including oysters) on the premises”.

Water quality information is extremely useful when investigating a problem in a nursery. Regular (daily) monitoring of water quality in the nursery is therefore recommended. Physico-chemical variables to measure include: water temperature, salinity, pH and dissolved oxygen.

When do I need to sample?

Spat should be sampled when received from the hatchery before being placed into the nursery system for the first time. Samples from the nursery should be collected 1-2 times a week. More frequent sampling will be needed if problems are noticed, for example 4-5 times a week. Samples should be stored in a well-ventilated, dry and cool location that is secure and cannot be accessed by children.

How do I know if there is a problem?

Some symptoms of health problems can include:

- spat cease growing,
- spat do not produce any faeces,
- shell colour lightens, or,
- spat do not close their shell when removed from water.

A microscope enables rapid assessment of spat health. A dissecting microscope that can magnify objects 20 to 40 times and is fitted with a ruler in the eyepiece (graticule) to measure the growth of spat is a very useful asset to detect problems.

Always check the volume and number of spat received from the hatchery and estimate the total number of spat removed from the nursery system. This allows comparison of the number of spat reared in the nursery against the number of spat originally ordered from the hatchery. If there is a significant shortfall there also may be a significant problem.

What do I do if there is a problem?

If a problem is suspected it is best to firstly, take samples of spat on all screens in the nursery system and secondly, call NSW DPI Fisheries (PH: 02 4982 1232) to speak with personnel from the bivalve hatchery for further advice.

Additional information, including methods to preserve larger oysters, can be found in the 'Collecting preserving and packaging oysters for disease testing' pamphlet available from the Animal and Plant Biosecurity Branch, NSW DPI (PH: 02 4982 1232). There are also other more detailed references that specify the methods to preserve spat listed at the end of this document.

The process of collecting and preserving a spat sample that can be used for further investigation is described below.

Steps for spat sampling:

1. Sample spat from screen.

Remove spat from the screen either by using a large pipette (Figure 1) to 'suck' the spat from the screen or gently scrape a Petri dish (Figure 1) over the screen.

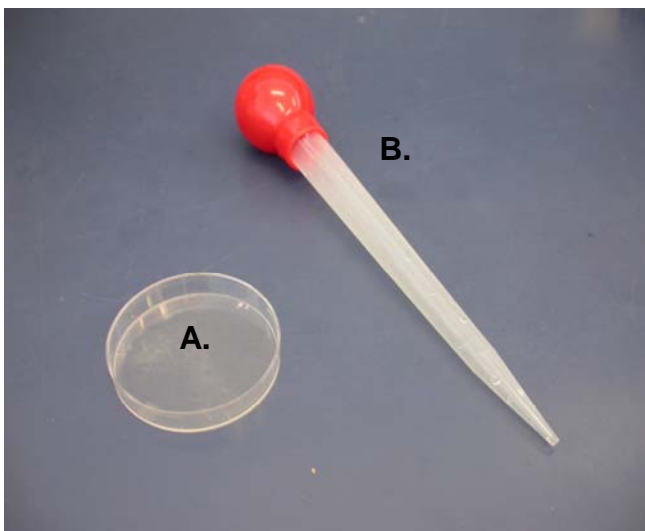


Figure 1. Petri dish (A) and pipette (B) used to sample spat off screens.

2. Empty spat into a specimen container.

These are usually 5 ml (for smaller spat) or 70 ml (for larger spat) in volume (Figure 2).

It is important to ensure that spat only take up 10% of the total volume of the container so that there is enough fixative to preserve spat properly. About 30-50 spat, depending on size, will be needed in the sample. Figure 2 shows a good spat volume to fixative volume ratio.

3. Fill specimen container with the fixative.

Two fixatives are used to enable different diagnostic techniques. Therefore, two samples of spat need to be collected on each occasion (one sample in each fixative). The fixatives used are 10% formalin and seawater and 70% ethanol. Please refer to the following section (Formaldehyde/formalin and ethanol) for more details about handling and using these chemicals.

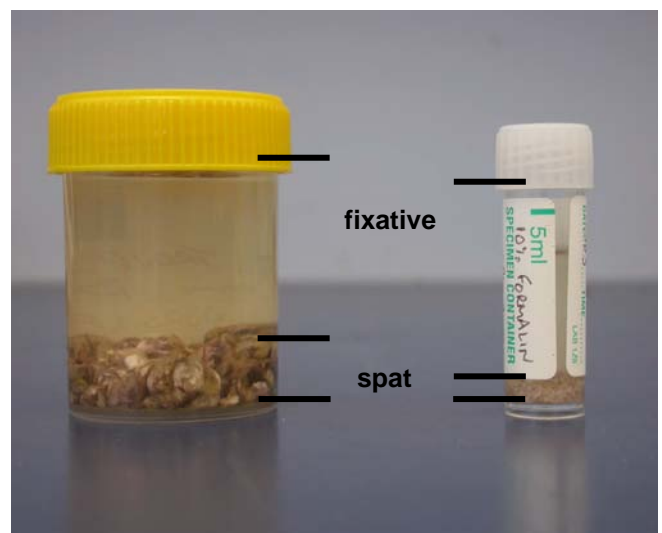


Figure 2. Example of spat samples in a 70 ml (left) and 5 ml (right) specimen container. Note the volume of spat to fixative ratio and the size difference of spat in each container.

4. Clearly label each container and store in a well-ventilated, dry, cool and secure place.

Label the container with: the species of oyster (e.g. Sydney rock oyster or Pacific oyster); the date that the sample was collected; the type of fixative (e.g. 10% formalin or 70% ethanol) and other general observations if a problem is suspected.

What do I do with collected samples if I notice a problem?

If you have spat health concerns samples should be submitted to a Regional Veterinary Laboratory. All submissions must be accompanied with a NSW DPI Veterinary Laboratory Advice form and an Oyster Mortality History Details form. Both forms are available from NSW DPI (phone: 02 4982 1232) or the following website:

NSW DPI Veterinary Laboratory Advice

Oyster Mortality History Details form

Oyster Packaging Guidelines are included with these forms and must be adhered to. Address samples for delivery to either:

Regional Veterinary Laboratory
Elizabeth Macarthur Agricultural Institute
Woodbridge Road
MENANGLE NSW 2568

Telephone Enquiries: 02 4640 6327
Facsimile: 02 4640 6400
Email: menangle.rvl@agric.nsw.gov.au

or

Regional Veterinary Laboratory
Wollongbar Agricultural Institute
Bruxner Highway
WOLLONGBAR NSW 2477

Telephone Enquiries: 02 6626 1262
Facsimile: 02 6626 1276
Email: wollongbar.rvl@agric.nsw.gov.au

Veterinarians may not always be able to provide definitive answers as to the exact cause or causes of the problem; however, they may be able to rule out particular infectious diseases. The cost of testing ten samples is around \$200.

Formaldehyde/formalin and ethanol

Chemicals used to preserve spat are toxic and hazardous at varying degrees. Use of these chemicals requires adequate training and full compliance with occupational health and safety requirements. For information on the specific risks, safe handling and safety equipment for these chemicals please read the appropriate Material Safety Data Sheet

available from chemical suppliers or the internet.

Contact with eyes and skin should be prevented. Do not breathe fumes, use only in a well-ventilated area and always wear suitable protective clothing. Chemicals for fixation can be obtained from aquacultural supply companies, chemical suppliers, chemists or veterinarians. The recipe for 10% formalin and seawater solution is one volume of concentrated formalin (usually supplied as 37% formaldehyde solution) to nine volumes of clean, filtered seawater.

Technical assistance

Should you require any further technical assistance or advice regarding oyster spat health or sampling please do not hesitate to contact either Dr Wayne O'Connor or Dr Michael Dove (NSW DPI staff) on 02 4982 1232.

References

Elston, R.A. (1999). 'Health Management, Development and Histology of Seed Oysters.' World Aquaculture Society, Louisiana, USA. 110 pp.

Howard, D.W. and Smith, C.S. (1983). 'Histological Techniques for Marine Bivalve Mollusks.' NOAA Technical Memorandum NMFS-F/NEC-25: Massachusetts, USA. 97 pp.

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