

Scallop diseases in New Zealand during 2015

This year (2015) has seen a number of reports of “ill thrift” in scallop populations from around New Zealand. Tests undertaken by MPI’s Animal Health Laboratory show a combination of many factors is behind the recent poor condition of the scallop populations at Great Barrier and Mercury Islands and in Pelorus Sound.

Earlier this year callers to the Ministry for Primary Industries (MPI) 24-hour Exotic Pest and Disease Hotline (0800 80 99 66) reported deformed, watery and smaller than normal scallops in these locations.

MPI Animal Health Laboratory (AHL) tested scallops collected from all three areas to determine if the decline in the beds and/or deformation of the roe and muscle was caused by an exotic disease or organism. Scallops from Queen Charlotte Sound were held to be in better condition than those in Pelorus Sound and were provided as a control.

AHL staff applied general aquatic bacteriology testing, histopathology and molecular testing to the scallop specimens and concluded the mortality and poor condition of the scallop populations are likely the result of a combination of causes.

The specimens from Pelorus Sound, collected in August/September 2015, were sourced from Waitata Bay and Ketu Bay. These showed a high load of a rickettsia-like bacterium in the gills and digestive gland. These organisms are common in New Zealand shellfish and cause major disruption to the gills, which in bivalves function primarily as a feeding organ. Note that the specimens collected from North West Bay and Horse Shoe Bay earlier in the year also had high loadings of an opportunistic bacterium, in this case *Vibrio splendidus*.

Samples from all three NZ sites (including both sets of samples from Pelorus Sound) were affected by *Perkinsus olseni*, a parasite that infects molluscs and is found in other shellfish species around the North Island and the top of the South Island. There was also inflammation and some degeneration of the digestive tract in many of the scallops. This digestive tract damage is found in samples from all three sites and is the most significant finding in the investigation.

AHL scientists analysed the scallops collected using molecular (polymerase chain reaction) testing. Molecular testing provides a rapid and highly specific diagnosis of diseases. One pathogen, *Perkinsus olseni*, was found at three sites but not in the Queen Charlotte Sound sample. *Perkinsus olseni* is established in New Zealand having been found in other shellfish species around the North Island for many years and in the last 18 months has been detected at the top of the South Island. Overseas, high levels of infection by *P. olseni* have caused significant deaths in susceptible shellfish species. The presence of the parasite can also slow the growth rate of shellfish.

No mass mortalities from *P. olseni* infection have been observed in New Zealand shellfish. Further, scallops are not thought to be particularly susceptible to *P. olseni* and this is borne

out by the low prevalence of the parasite found in the samples and in the quite different presentation of the parasite in the histology samples.

Examination also showed inflammation and some degeneration of the digestive tubules in most of the scallops. This damage is found in samples from all sites and is the most significant finding in the investigation. Little scientific research has been done to determine how this damage is caused but there is a suggestion, based on work done last century, that a 'virus-like' particle may be a contributing factor.

Regardless of the causes, because the scallop can't feed properly, damage to the gills and digestive tract compromises wellbeing, reducing the ability to cope with other stresses. These could be environmental (for example, changes in salinity, temperature or levels of nutrients in the water) or biological (for example, opportunistic pathogens). Even natural events with high energy requirements, such as spawning, might be enough to cause serious effects if the scallops are unable to recover because they can't feed properly.

All the Mercury Island scallops also had parasite cysts present, and half had a marked immune response. The immune response is likely inflammation due to the presence of these cysts which indicate the presence of a parasite, possibly an intermediate stage of a parasite of fish or skates. The presence of a parasite is not thought to be a significant cause of disease in healthy animals, however, in a scallop that is already under stress, an infestation could further compromise health.

Bacteriological culture did not identify anything significant in the Great Barrier or Mercury Island specimens. However, samples from Pelorus Sound showed a high bacterial load of *Vibrio splendidus*, a common opportunistic bacterium in New Zealand waters. Stressed animals are more susceptible to bacterial attack and, therefore, the digestive tract damage may have contributed to the degree of infection.

In this investigation there was not one casual factor or disease and, therefore, the mortality and poor condition of the scallop populations are likely the result of a combination of many natural causes.

The affected scallops do not pose a food safety risk. However, as is the case with any animal, shellfish that are obviously sick and dying should not be eaten.

MPI will continue to keep a close eye on the wellbeing of these scallop fisheries and encourages fishers and members of the public to report any concerns or abnormalities they observe.