Quarterly report of investigations of suspected exotic marine and freshwater pests and diseases

Pyura on a vessel, Wellington

A diving company called the MPI exotic pest and disease hotline to report a sea squirt on a vessel hull. It was suspected to be Pyura dopplegangera, an aggressive competitor for space that has the potential to significantly alter the composition of intertidal communities. The divers took samples and photos and submitted them to the Marine Invasives Taxonomic Service (MITS) at NIWA. MITS confirmed that the samples were P. dopplegangera. The vessel was cleaned under border direction and the biosecurity risk was mitigated.

Algal bloom, Awanui

A fisherman contacted MPI about a strange-looking alga growing in Awanui Harbour, Northland. The alga was dark brown in colour. He had first noticed it a year earlier, but observed that it was growing rapidly. A sample was sent to MITS and identified as Ectocarpus sp, but taxonomists were unable to identify it to species level, owing to a lack of sequence data and the fact that species boundaries are not always clear within this genus. However, they were confident that this was an indigenous species because the sequence was nearly identical to that of a specimen collected at Kaka Point in South Otago. As there was no biosecurity risk the investigation was stood down.

Farmed paua mortalities, Ruakaka

An employee called the MPI exotic pest and disease hotline to discuss mortalities at a paua farm. The paua (Haliotis iris) were showing signs of Perkinsus infection. P. olseni is an exotic OIE-listed disease and has previously been recorded in paua at this location. It typically presents a spike in mortality over the summer, when water temperatures increase. Samples sent to the MPI Animal Health Laboratory tested positive for P. olseni and negative for P. marinus. As this event was attributed to a recurring disease it did not present a biosecurity risk and the investigation was closed.

Yersinia ruckeri in salmon

A Palmerston North veterinary laboratory contacted MPI regarding a suspected case of Yersinia ruckeri infection in salmon from a South Island hatchery. The serotype 01b (Biotype 1) of Y. ruckeri is considered endemic in New Zealand and has been isolated from salmon hatcheries on the east coast of the South Island. It is generally considered a production disease and an indicator of underlying environmental or husbandry issues, which can be addressed by improving water quality and reducing stress in fish. Endemic Y. ruckeri is generally confined to salmon cultured in fresh water and is not considered a threat to marine systems. Exotic strains including the Hagerman strain are Unwanted Organisms under the Biosecurity Act 1993, so cultures are sent to the MPI Animal Health Laboratory to rule out exotic strains. Testing of one bacterial culture on blood agar was subcontracted to the Australian Animal Health Laboratory for Y. ruckeri serotyping. The culture morphology was homogenous and consistent with control cultures. The isolate was examined directly by macroscopic agglutination against cross-absorbed rabbit antisera for Y. ruckeri serotypes 01a and 01b. Control isolates Y. ruckeri ATCC 29473T (01a Type strain) and Y. ruckeri 88:8181-5A (01b Aust. field isolate) were tested in parallel. No significant agglutination was observed with the test isolate in 01a antiserum. Strong agglutination was observed with the test isolate in 01b antiserum. Therefore it was concluded that the test isolate was serotype 01b (the endemic strain). The results were reported back to the hatchery and the investigation was stood down.

Kokopu egg mortalities, Warkworth

A kokopu (whitebait) farmer called the MPI exotic pest and disease hotline to report large mortalities of kokopu eggs at his whitebait farm, although the adult fish appeared healthy. The notifier was uncertain whether the cause was a pathogen or husbandry issues. He had been in contact with NIWA, who were undertaking tests, and was referred to MPI for more refined diagnostic testing. Samples were sent to the MPI Animal Health Laboratory for disease testing. Histology revealed some fungal and bacterial growth in the eggs as well as some thinning of the vitelline membrane. The significance of this was unclear but the growth was inconsistent and not suggestive of a primarily pathogenic process. Bacteriology and mycology identified several bacteria and fungi, none of which was considered likely to be pathogenic, but more likely generic environmental species. Virology did not reveal any significant viruses. A second lot of samples was submitted to investigate the thinning in the vitelline membrane and to rule out Saprolegnia, which does not present under normal mycology testing. The second round of histology showed inconsistent bacterial and fungal growth in the eggs and significant variability in the vitelline membranes across samples. The results were all negative for Saprolegnia. These combined results suggested that the cause of the egg mortalities was not a primarily pathogen-driven process. It is more likely that there was a husbandry-related issue causing the low survival of eggs, either through a secondary bacterial and fungal degradation process, or by predisposing the eggs to infection from...
environmental bacteria and fungi. It was concluded that there was no biosecurity risk and the investigation was closed.

**Suspected tail-fan necrosis, Wairarapa**

A rock lobster caught on the Wairarapa coast had small lesions on the tail, which were suspected to be the early onset of tail-fan necrosis (TFN), an emerging syndrome of rock lobster that has only previously been reported in the Gisborne region. No similar signs were seen on one other male lobster of similar size collected at the same site and two more from further up the coast. The affected lobster was refrigerated and taken to the MPI Animal Health Laboratory.

The results of pathology testing showed that the observed symptoms were not specific to tail-fan necrosis and that the lesions were more likely associated with a cuticle-degrading infection secondary to tail damage. Bacteriology of the haemolymph showed the presence of Pseudomonas and *Vibrio* spp. but the significance of these bacteria is unknown as they can be pathogenic or commensal. Given the low level of infection, it is likely that these findings were not significant. It was concluded that the lesions were caused by a small wound infection and that this was not a case of TFN. As there was no biosecurity risk the investigation was closed.

**Spat mortalities, Nelson**

The Cawthron Aquaculture Park reported to MPI a recent mortality event in greenshell mussel spat (*Perna canaliculus*). The mortality event was first noted in a small portion of 1–2-month-old spat retained at the hatchery after most of the batch had earlier been deployed to sea. Supplementary algal paste was being fed at relatively high doses when the mortality event developed, but this was not expected to be harmful. The mortality rate appeared to have declined rapidly (based on shell washout) and there was no indication of ongoing mortality in the remaining spat, which appeared healthy. No significant pathogen or disease agents were identified and no clear cause was found. Potentially harmful ammonia concentrations were detected in some tanks, but it is not clear whether this was a cause or a result of the mortalities. Spat from the same batch held in experimental tanks in the same room did not show such mortalities. They received water from the same source and live algal food, but a higher water replacement rate and no algal paste supplement. This suggests that environmental conditions or the algal paste were potential causes of the mortality event. Larvae in a separate part of the hatchery building were unaffected, ruling out a generic water quality issue.

**Cockles, Whangateau Harbour**

MPI received an email from a member of the public who was concerned about recurring shellfish mortality events in Whangateau Harbour. In 2009 there was a large cockle (*Austrovenus stutchburyi*) mortality event associated with a coccidian parasite and a mycobacterium, resulting in about an 80 percent reduction in the cockle population. Three sampling rounds were undertaken and some *Perkinsus* sp. and *Rickettsia*-like organisms were detected at a very low prevalence. Some cockles also showed a low prevalence of *Digenea* metacecaria, and spores indicative of coccidians (apicomplexans) infection. Brown cells associated with gonad absorption were common. Prior infections by apicomplexans, mycobacteria (acid-fast bacteria) and even cnidarians (possibly opportunistic invaders) were also evident. Bacterial culture yielded only common environmental bacteria. Although some of these bacteria could act as pathogens, their low prevalence indicated that they were not a primary pathogen. It was concluded that there was no biosecurity risk and the investigation was stood down.

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