

Quarterly report of investigations of suspected exotic marine and freshwater pests and diseases: January to March 2020

New to New Zealand alga, Lyttelton

NIWA notified MPI of a new to New Zealand alga collected during the MPI Marine High Risk Site Surveillance survey (MHRSS) in Lyttelton. Several specimens were collected from marina pontoons at two locations. Molecular sequencing identified the species as *Fushitsunagia catenata* whose native range is Japan and Korea. The type locality is Shimodo, Japan. *F. catenata* has not previously been reported outside its native range so the likelihood of its becoming established in New Zealand is hard to assess. Environment Canterbury was notified of the detection and the risk assessment, and the investigation was closed.

Unusual green seaweed, Whangarei

A member of the public swimming at Whangarei Heads noticed an unusual ball of seaweed attached to a rock. Photos were taken of the seaweed and sent to MPI for identification. The alga was tentatively identified by an Incursion Investigator as the native green alga *Codium fragile*. The photos were sent to NIWA's Marine Invasives Taxonomic Service (MITS) taxonomists, who confirmed the identification. As *C. fragile* is native to New Zealand, there was no biosecurity risk and the investigation was closed.

Skin lesions on grey mullet, Paparoa, Northland

A member of the public caught a grey mullet (*Mugil cephalus*) with unusual skin lesions. The fish was one of several caught, but only one displayed the symptoms. The fish was sent to the MPI Animal Health Laboratory (AHL) for testing to rule out exotic strains of *Aeromonas salmonicida*, the bacterium that causes the disease furunculosis. PCR tests were negative for *A. salmonicida*, but positive for *Myxobolus episqamalis*. This myxozoan parasite was first detected on grey mullet in New Zealand in 2015. It causes granular lesions on the scales and fins of grey mullet, which affect

Exotic disease investigations are managed and reported by the MPI Diagnostic and Surveillance Services, Wallaceville. The following is a summary of investigations of suspected exotic marine and freshwater diseases and pests during the period from January to March 2020.

the appearance of the fish but have not been associated with mortalities. The prevalence of the parasite appears to be low within the fish population and it has likely been naturally present in New Zealand for many years but hitherto undetected. As it is established and widespread in New Zealand the investigation was closed.

Tubeworms found on vessel hull, Napier

Hawke's Bay Regional Council staff found several unknown polychaete tubeworms on a vessel hull during a hull inspection in Napier Harbour. Photos of the tubeworms were sent to MITS for identification. A NIWA taxonomist identified the worms as from the serpulid family, most likely a *Hydroides* species. A sample was needed for identification to species level but the vessel had already left Napier. A traceback of the vessel's movements over the previous 12 months indicated it had only travelled in New Zealand waters, including Whangarei, Great Barrier Island, Slipper Island, Tauranga, Hicks Bay, Tolaga Bay and Gisborne. Several species of *Hydroides* tubeworms are already present in New Zealand. The risk that this was a new to New Zealand species appears to be low and therefore the investigation was closed.

Dead crabs washed up on Back Beach, Nelson

A large number of dead crabs were washed up on an estuarine beach near Nelson. Videos of the dead crabs show a large number distributed along the high tide mark. The species could not be confirmed from the video, but based on the habitat was likely to be the endemic species *Hemiplax hirtipes*,

commonly known as stalk-eyed mud crab and a common estuarine species. No sample of the crabs was collected by the notifier, so the cause of death could not be determined. No subsequent mortality events have been reported. Environmental conditions at the time were hot and sunny with a strong breeze, which may have contributed to the mortalities.

Unusual organisms washed up, Southland

The notifier found a large number of unusual, fleshy organisms washed up on Oreti Beach in Southland. They ranged in size from about 10 to 30 cm. Photos were sent to MITS for identification. Taxonomists identified the organisms as an indigenous holothurian (sea cucumber), *Paracaudina chilensis*. This species (**Figure 1**) lives buried in soft sediment and can be exposed by severe weather and waves. As there was no biosecurity issue the investigation was closed.

New to New Zealand seaweed, Wellington

A Victoria University staff member collected seaweed specimens they believed were *Schizymeria apoda* in Whairepo Lagoon, a small inlet in downtown Wellington. *S. apoda* is a non-indigenous red alga established in several New Zealand ports and was first reported in 2009. The specimens were sequenced by Victoria University as part of a research project and identified as *S. dubyi*, which is morphologically very similar to *S. apoda* and can only be differentiated by molecular techniques. In fact both species were growing together in the lagoon. *S. dubyi* is widespread throughout the world, including

Australia. New Zealand has three native *Schizymenia* species and it is likely that *S. dubyi* has been present for some time but assumed to be one of the other species. NIWA is re-examining samples collected from other ports to determine whether *S. dubyi* may be more widely distributed. There is no biosecurity risk associated with this species and therefore the investigation was closed.

Suspect ascidian on vessel hull, Picton

Marlborough District Council biosecurity officers observed ascidians suspected to be *Clavelina oblonga* on a vessel in Picton that originated from Wellington. This is a non-indigenous ascidian currently only known to be present at Smokehouse Bay, Great Barrier Island. Photos of the ascidian were sent to MITS, where they were identified as the closely related *C. lepadiformis* (lightbulb ascidian), another non-indigenous species known to occur in both Picton and Wellington. As the species was already established in Picton, there was no additional biosecurity risk and the investigation was closed.

Fish mortality, Lake Taupo

A member of the public reported seeing more than 10 small dead fish during a morning swim in Lake Taupo. The notifier believed the fish may have been trout, and described the water as unusually warm in the area where the dead fish were seen. Many freshwater fish, including trout, are sensitive to high water temperatures, which are often correlated with low levels of dissolved oxygen. No sample was able to be collected owing to the delay between observing the fish and reporting them to MPI. The notifier was asked to contact MPI again if they again noticed any similar events. The cause of death was inconclusive but may have been related to water temperature.

Suspect grey side-gilled sea-slug, Auckland

A member of the public notified MPI of a large number of sea-slugs on Kohimarama Beach, Auckland. The notifier believed they might be grey side-gilled sea-slugs (*Pleurobranchaea maculata*). Consumption of dead *P. maculata* was implicated in the death of several dogs in

2009 after the slugs were found to have tetrodotoxin present in their bodies. Photos of the sea-slugs were requested, to rule out *P. maculata*. The photos were consistent with the ragged sea hare (*Bursatella leachii*), which occurs worldwide, including in New Zealand waters, and MITS confirmed this identification. In late summer, *B. leachii* spawn en masse in shallow tidal bays and then die. Large numbers of them may then wash ashore. The investigation was closed.



Figure 1: Specimens of the holothurian *Paracaudina chilensis* washed up on Oreti Beach, Southland. (Photo: Macaela Hawkins.)

Shellfish mortality, Horowhenua

A Fisheries Officer contacted an Incursion Investigator to report a mass mortality of shellfish at Waikawa beach on the Horowhenua coast. The mortality event had actually occurred 3 days previously and although specimens were collected, unfortunately they were not suitable for diagnostic testing. The main species collected were *Dosinia anus*, but *Crassula aequilatera*, *Paphies subtriangulata*, and *Spisula discors* were also present. The cause of the mortalities remained inconclusive.

Dead fish in estuary, Bay of Islands

A member of the public reported a large number of small dead fish in a shallow waterway near some mangroves. Photos of the fish were requested, but were not of sufficient resolution to identify the species. An Incursion Investigator sent a collection kit for the notifier to collect some specimens for diagnostic testing at

the AHL, but transport delays meant that no specimens were able to be collected. It is possible that the shallow tidal location and large number of fish contributed to a case of localised oxygen depletion. Additionally, biotoxin testing by MPI near the site indicated elevated levels of ichthyotoxic plankton that may have also contributed to the mortality. However, the cause remained inconclusive.

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Biological risk of *Calathea* house plant investigated

When a consignment of various house-plant species was imported into New Zealand for commercial propagation, one species, *Calathea orbifolia* (Magnoliopsida: Marantaceae), was denied border entry as it was not listed on MPI's Plants Biosecurity Index (PBI). The importer queried this decision, pointing out that this species was currently offered for sale in NZ. MPI's Plant Health Incurion Investigation Team was subsequently notified and an investigation initiated to determine the biological risk associated with this plant.

While there are more than 20 species of *Calathea* and numerous cultivars, the investigation determined that it was unclear exactly how many are present in NZ or how long they have been here. It is known that some species have been cultivated here for many decades as house plants, but interpretation of available information is difficult owing to the large number of synonyms of some species (e.g. >10 for one species). In addition, traded plants are called by a mixture of currently accepted species names, old species names (synonyms) and varietal names. Despite this complexity, when a list of *Calathea* plants currently offered for sale is compiled from NZ websites and compared with the PBI, some species are present and traded but are not on the PBI, including *C. orbifolia*.

It is not unusual for a plant to be present and commercially propagated in NZ yet absent from the PBI. The PBI is a list of species that have been assessed by MPI to identify any biosecurity risks, and for which measures have been identified in an Import Health Standard (IHS) to manage the risks if those species are imported. While all plants on the list have officially been determined by the Environmental Protection Authority (EPA) to be present in NZ, the PBI is not a list of all plant species present in NZ, nor does it list endemic species. Many (possibly thousands) of exotic plant species likely to be present in NZ are absent from the PBI and other NZ databases. Plant importers frequently

assume that all the species present in NZ are known and listed somewhere, but this is not the case: it is still unclear how many exotic plant species are present, particularly garden and amenity species. Despite cultivation of *Calathea* house plants for many decades, investigation found no readily accessible records of *C. orbifolia* or other *Calathea* species in NZ herbaria or in other mainstream collections and databases. As indicated above, this is not surprising, as records of many exotic garden and amenity plant species are informal, such as plant stock lists and nursery catalogues. Botanical names may be used loosely in these informal records so it can be difficult to determine the correct species names and identities of plants listed. These records are not considered reliable for biosecurity regulatory purposes, although they are obviously useful for indicative reasoning during investigation. Hence, the absence of a plant species from NZ databases is not evidence that it was previously absent from the country.

To check the authenticity of the plant being traded as *C. orbifolia*, a single plant labelled *Calathea orbifolia* was purchased from a garden centre (Figure 1) and sent to Manaaki Whenua – Landcare Research's (MWLR) botanists for identification. Based on morphological analysis, MWLR confirmed the specimen as *C. orbifolia*. Molecular analysis of leaf samples sent to EcoGene further confirmed this.



Figure 1: *Calathea orbifolia* plant.

A core function of the Plant Health Incurion Investigation Team is to investigate and assess the biological risk of species newly detected by our targeted and general surveillance programmes (mostly notified through the pest and disease hotline, 0800 80 99 66). Apart from the incident in question, the investigation found no evidence of other imports (including illegal imports) of *C. orbifolia* into NZ. This indicated that the species had been present and cultivated here for many years and had been distributed widely as a result. Regardless, because a full risk assessment and IHS did not exist for *C. orbifolia*, the Incurion Investigator made an initial assessment of the biological risk to determine whether further action was warranted. The investigation concluded that the biological risk was very low and no further action by MPI was justified. *Calathea* spp. are tropical plants with a low risk of naturalisation in NZ and no reference could be found suggesting any invasive potential. Additionally, the investigation concluded there were many plants in NZ similar to *C. orbifolia*; that is, plants that have been present and cultivated here for many decades, yet not recorded on official lists, including the PBI. Historic investigations by incurion investigators are testament to that. As highlighted in this investigation, there is inadequate cataloguing of cultivated plants in NZ. This has implications for commercial growers and plant breeders acting in good faith, and can also impede the enforcement of the law regarding illegal plant imports. It is also an impediment to the EPA's determination of a plant's "New Organism" status under the Hazardous Substances and New Organisms (HSNO) Act 1996 (that is, its presence in NZ prior to 29 July 1998). An improved, more definitive list of all the plant species present in NZ is required.

Therefore, it is very encouraging to announce that a major initiative to significantly improve the documentation and recording of cultivated plants in New Zealand has been funded through MPI's Sustainable Food & Fibre Futures fund and industry partners: the Royal NZ Institute of Horticulture Inc, MWLR

and several horticultural organisations. The 3-year project “Taking Stock: Resolving New Zealand’s Cultivated Plants Problem” commenced in January 2020 and aims to co-ordinate scattered information, check the taxonomy of species and document the correct and current plant names. The resulting information will be publicly available on the New Zealand Plant Names Database (Ngā Tipu o Aotearoa) and the New Zealand Organisms Register (NZOR). This project will also submit applications to the EPA for section 26 presence in NZ determinations.

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