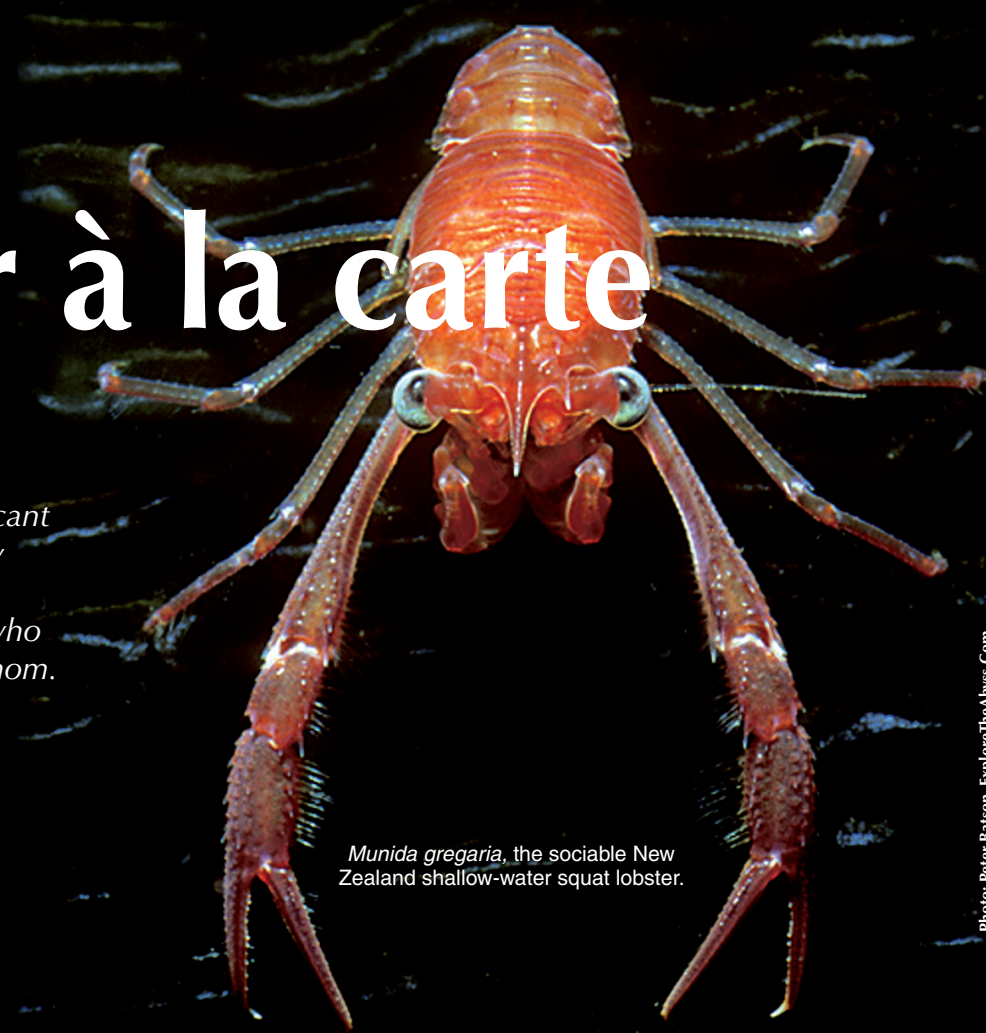


Marine Biodiversity

Lobster à la carte

'Squat lobsters' provide a significant food source for fish around New Zealand. **Kareen Schnabel** and **Amelia Connell** take a peek at who lives where and who's eating whom.



Munida gregaria, the sociable New Zealand shallow-water squat lobster.

Photo: Peter Batson, ExploreTheAbyss.Com

The crustaceans commonly referred to as squat lobsters are among the most abundant and diverse marine decapods worldwide. Their three families contain nearly 900 species and inhabit a range of environments including coral reefs, continental shelves and slopes, seamounts, cold seeps, and hydrothermal vents. However, knowledge on their diversity and importance to benthic communities is limited. Recent research at NIWA is showing that New Zealand squat lobsters are very species-rich and also an important component of fish diet.

All in the (super) family

Marine squat lobsters belong to the families Kiwaidae, Galatheidae, and Chirostylidae, all members of the superfamily Galatheaidea. Often brightly coloured, with spines scattered over their bodies and appendages, they all vaguely resemble a small lobster or crayfish.

The abundance and diversity of squat lobsters has stimulated considerable taxonomic research in recent years; since 2005 more than 110 new species and four new genera (including the new family for *Kiwa*) have been described, the majority from the Pacific Ocean including Australia and the South Pacific islands from New Caledonia to French Polynesia. However, the New Zealand fauna remains vastly understudied: current taxonomic research by NIWA and overseas scientists is the first since 1974! Back then, only 19 species of galatheids and chirostylids were known from the entire New Zealand region, a number that is growing fast as museum collections around the country and globe are studied. Within the last two years, descriptions for 30 New Zealand species have been completed

Undersea delicacies

- Squat lobsters are abundant, diverse, and an important source of food for New Zealand marine fishes.
- Two of the three families are well represented in New Zealand waters.
- The squat lobsters of New Zealand have not been very widely studied, despite their major role in our marine ecosystems.

or reached their final stages, and approximately 35 further new species await description. Adding the many known species that have not been recorded from New Zealand before, the entire fauna now stands at 130 species, and counting.

Kiwaidae (pronounced Ki-wa-ids) are represented by a single species, *Kiwa hirsuta*, the furry 'yeti crab'. In 2006, this unique creature received a lot of media attention when it was recovered from deep hydrothermal vents off the Easter Islands in the southeastern Pacific. The site remains the only known location of this family.

Galatheids are the most species-rich group with nearly 700 species worldwide, ranging from lentil-sized species common in tropical shallow-water reefs to large species of the genus *Munidopsis* that grow up to egg-size, live at abyssal depths (greater than about 3000 m), and can occur in huge numbers on hydrothermal vents and cold seeps. Other species congregate in such throngs during an early life stage that they form 'red tides' that become an important food source for baleen whales, sea birds, and fish. One such species, *Munida gregaria*, produces swarms around the coasts of New Zealand, Tasmania, Patagonia, the Falkland Islands, and some



Photo: Niel Bruce.

Langostino amarillo (*Cervimunida johni*) sold in the fish market in Coquimbo, Chile. The whole animal is approximately 7–8 cm long.

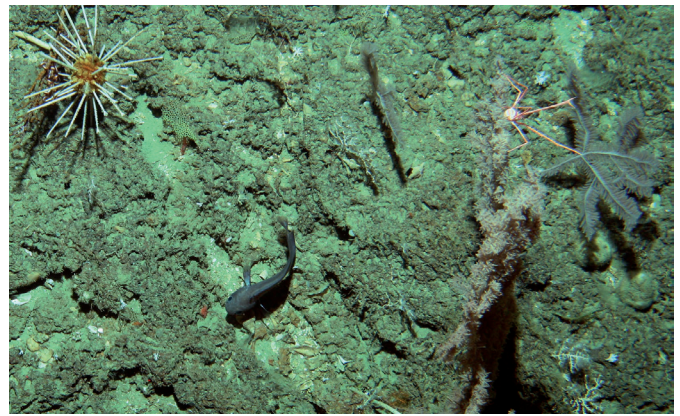


Photo: NOAA / NIWA TAN0616

The chirostyloid *Gastroptychus rogeri* takes its usual stance, perched on a black coral (upper right).

sub-Antarctic islands. *Munida gregaria* in New Zealand and *Pleuroncodes planipes* in Chile occur in such vast numbers in their planktonic stage that commercial harvest has been suggested in the past but has never proven viable. Meanwhile, adult-stage *P. planipes* and *Cervimunida johni* provide a significant benthic-trawl fishery off the coast of Chile.

Chirostyliids are some of the largest squat lobsters; they can measure more than 30 cm from the tip of the claws to the end of the tail and often have extremely slender and elongated appendages. Worldwide, more than 180 species are known and it appears that the majority are adapted to living among the branches of corals from the shallow-water tropics to the deep-water coral beds along steep continental margins and seamounts. The coral probably provides shelter, as well as an elevated position for reaching food items in the water above.

Catch of the day

Considering the sheer abundance of some squat lobsters, such as *Munida gregaria*, it comes as no surprise that they provide a significant food source for fish around New Zealand. A NIWA study of the diet of commercially important and by-catch fish commonly trawled at depths between 200 and 800 m on the Chatham Rise looked at the contents of 5925 fish stomachs. We found 11 fish species had fed on galatheids: red cod, ling, smooth skate, ghost shark, sea perch, stargazer, orange perch, lookdown dory, and three species of rattails. Of these, squat lobsters are particularly common in the diets of ling, oblique-banded rattail, and red cod. Galatheids turned out to be the most important part of the red cod's diet, and are a

similarly popular menu item for ling: nearly a third of the ling we analysed had eaten a *Munida* species. Galatheids make up an especially large part of small ling's diet, but as the ling grows and starts to feed more on fish, squat lobsters become less important in the diet. Galatheids are also a food source for some rattails, whose body size is much smaller than red cod or ling. The stomach of the small-bodied rattail can be completely filled with a single specimen of *Munida* – perhaps a case of their eyes being too big for their stomach.

Camera surveys during the Oceans 2020 voyage on the Chatham Rise have revealed the prevalence of the main prey species *Munida gracilis* on the sea floor. They were photographed in large numbers, half hidden in small burrows and under any sheltering object. Together with other bottom-dwellers, they provide an enticing morsel for bottom-feeding fish, and are also a welcome appetiser for fish with different culinary tastes, like the sea perch or ghost shark, which usually prefer other crustaceans or invertebrates.



Photo: Ocean Survey 2020 voyage TAN0705

Spot the three *Munida gracilis* and the flatfish! The squat lobsters were observed seeking shelter under most objects available on the sea floor, 470 m deep on the Chatham Rise.



Photo: ROPOS RV Sonne Cruise SO192-2 Mango

Munidopsis species congregate around a cold seep in the Fiji Lau Basin. (A single individual is circled.)

Treasure trove of biodiversity

The ocean surrounding New Zealand is a treasure trove for studies on biodiversity and biological interactions. Our unique geographical and geological position and distinctive marine fauna provide many opportunities for discoveries and for testing research hypotheses. But any work on species assemblages and interactions relies heavily on taxonomic knowledge of each of the components of the communities, and we still have a lot to learn about the pieces of the puzzle! [W&A](#)

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