

The common periwinkle *Littorina littorea* in British Columbia – first records and potential consequences
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Chris Harley photo

Pisaster ochraeus consuming two *Littorina littorea* in a laboratory trial. The common periwinkle *Littorina littorea* in British Columbia – first records and potential consequences. Chris Harley, Associate Professor, Dept. of Zoology, University of British Columbia.

One of the reasons I enjoy teaching is that my students frequently discover things that I might otherwise overlook. For example, on a field trip to the shores of Vancouver's Stanley Park for my University of British Columbia Marine Ecology course in early 2010, a student walked up to me with a snail and said, "What's this?" All I could immediately answer was, "Not native." It looked like a *Littorina littorea* (Linnaeus, 1758), which I was familiar with through my own undergraduate field trips when I was a student in Rhode Island. Based on the morphology of the shell and soft parts – my students still tease me for emailing photos of a snail's naughty bits around the world for identification – we confirmed that we were indeed dealing with the common periwinkle, *L. littorea*. It was the first ever record from British Columbia.



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Subsequent trips to that site (Ferguson Point) revealed over 150 snails, which were dutifully removed. With the help of my students and my three year old daughter Zoe, we have now also found nearly 200 *L. littorea* at Acadia Beach near UBC, and a single empty shell a bit further west at Tower Beach. Where were these snails coming from? How likely are they to become a permanent part of our local ecosystem? And what impacts might they have?

The answer to the "how did they get here" question appears to be the live seafood trade. Live periwinkles are sold at several seafood markets in Vancouver and Richmond. Availability, possibly coupled with the actions of well-intentioned citizens (a Buddhist tradition involves the release of live seafood at the new year), may explain their sudden appearance.

Are periwinkles here to stay? They have survived for over a year at one site, so the physical environment may not be a limiting factor. The answer to this question could

therefore depend on how well periwinkles can cope with our native animals. In some cases, native species will either out-compete or simply eat a newly introduced species, preventing it from becoming established; scientists refer to this as “biotic resistance.” In the Pacific Northwest, the major intertidal predators are sea stars, namely ochre stars (*Pisaster ochraceus*) and sunflower stars (*Pycnopodia helianthoides*). In our laboratory experiments, we have found that *L. littorea* is very naïve in the presence of these dangerous predators. Unlike our native snails, periwinkles take no evasive action when touched by a sea star or held in water that contains the chemical “scent” of sea stars. This may be expected, as sea stars are not an important part of the seashore ecology in the periwinkle’s home range in the Atlantic. As a result of their blissful ignorance of the sea star threat, *L. littorea* are readily captured and eaten by *Pisaster* and *Pycnopodia* in the lab. Whether this will happen in the wild remains to be seen.

If our sea stars don’t come to the rescue, what will the ecological impact of *L. littorea* be? The short answer is we don’t know, but it will probably be substantial. In areas that *L. littorea* has invaded in the Canadian Maritimes and New England, it has become almost ludicrously abundant (up to several hundred per square meter). Ecologically, periwinkles are known to inhibit the establishment of seaweeds and barnacles, reduce species diversity, and even transform marsh habitat into cobble beach habitat. If they are not eradicated in British Columbia, the same things could happen here.

My lab group is continuing to do research on this species and its potential impacts, and initiating some outreach activities to alert the public to the dangers of releasing live marine creatures. Hopefully, this will help stem the tide of new introductions. In the mean time, Zoe and I will continue to go snail hunting on our free weekends. She’s getting pretty good at it.

