



Where It's Easy Being Green

For scientists on Calvert Island, every year yields more seaweed discoveries.

Published August 26, 2021, By Josh Silberg

“For still there are so many things that I have never seen:
in every wood in every spring there is a different green.”

- *Bilbo Baggins in The Fellowship of the Ring*

If you're an alga, the Calvert Island coastline has it all—sheltered bays, wave-battered rocks, shallow lagoons, and powerful ocean currents. No matter your lifestyle, there's a nook or cranny available. It's why algal experts Sandra Lindstrom, Patrick Martone, and their team kept coming back for a decade—every year brought new surprises.

In 2011, the scientists began their inventorial journey to write “*The Marine Flora of Calvert Island*”—a monumental tome of all three major algae groups: green, red, and brown. With an all-star lineup of experts, the

grand algal opus seemed possible—until they ran into a good problem. There are a heck of a lot of seaweed species on Calvert Island. So where does a seaweed scientist even begin?

“The green [algae] seemed like the most manageable,” says Martone, a professor at the University of British Columbia (UBC). “Which is funny because I find greens to be a really tricky group.”

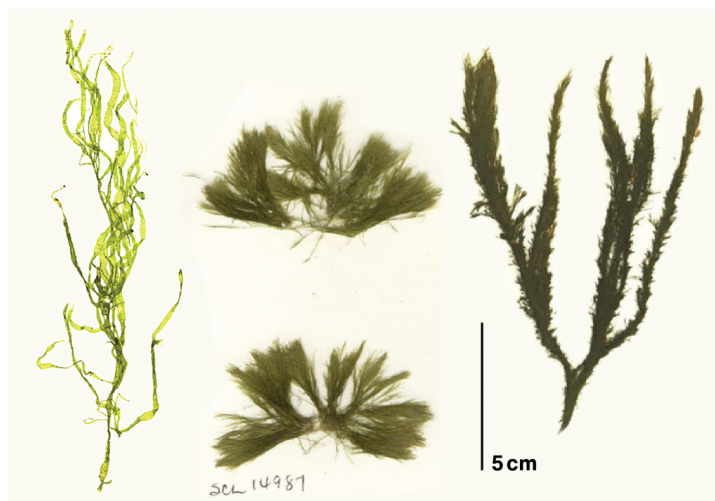
To confidently identify a seaweed species requires a back-and-forth of expertise and technology with some artistry in between. Step one is to collect seaweed samples and press them onto special paper in much the same way that you’d press flowers for preservation. Green algae come in a plethora of shapes and forms. Paper-thin blades. Nondescript rock fuzz. Interlocking strands of an intricate feather boa. A weirdo called dead man’s fingers, *Codium fragile*, whose dozens of branches are made up of only one cell (example in header photo).

With each pressing, an expert ascribes a species name as best as possible, while a small clipping is brought back to the lab for DNA barcoding. It’s in the DNA that hidden species are revealed. Take a single-celled wonder called *Derbesia*, aptly called green sea grapes after their spherical reproductive form.

“There was only supposed to be one species of *Derbesia* in the area,” says Lindstrom, an adjunct professor at UBC and a renowned algal expert. “We never saw that one. Instead we found three species and don’t have a name for any of them.”



The grape-like spheres are the reproductive, or halocystis, form of Derbesia—one of three yet-to-be-named species of this green algae found on Calvert



A collage of three species of green algae pressed onto herbarium paper for preservation. Left to right: Ulva prolifera, Acrosiphonia sonderi, and Acrosiphonia coalita. Photos by Sandra Lindstrom

Island. The Derbesia are growing on a rhodolith, a calcareous red alga in the genus Lithothamnion.

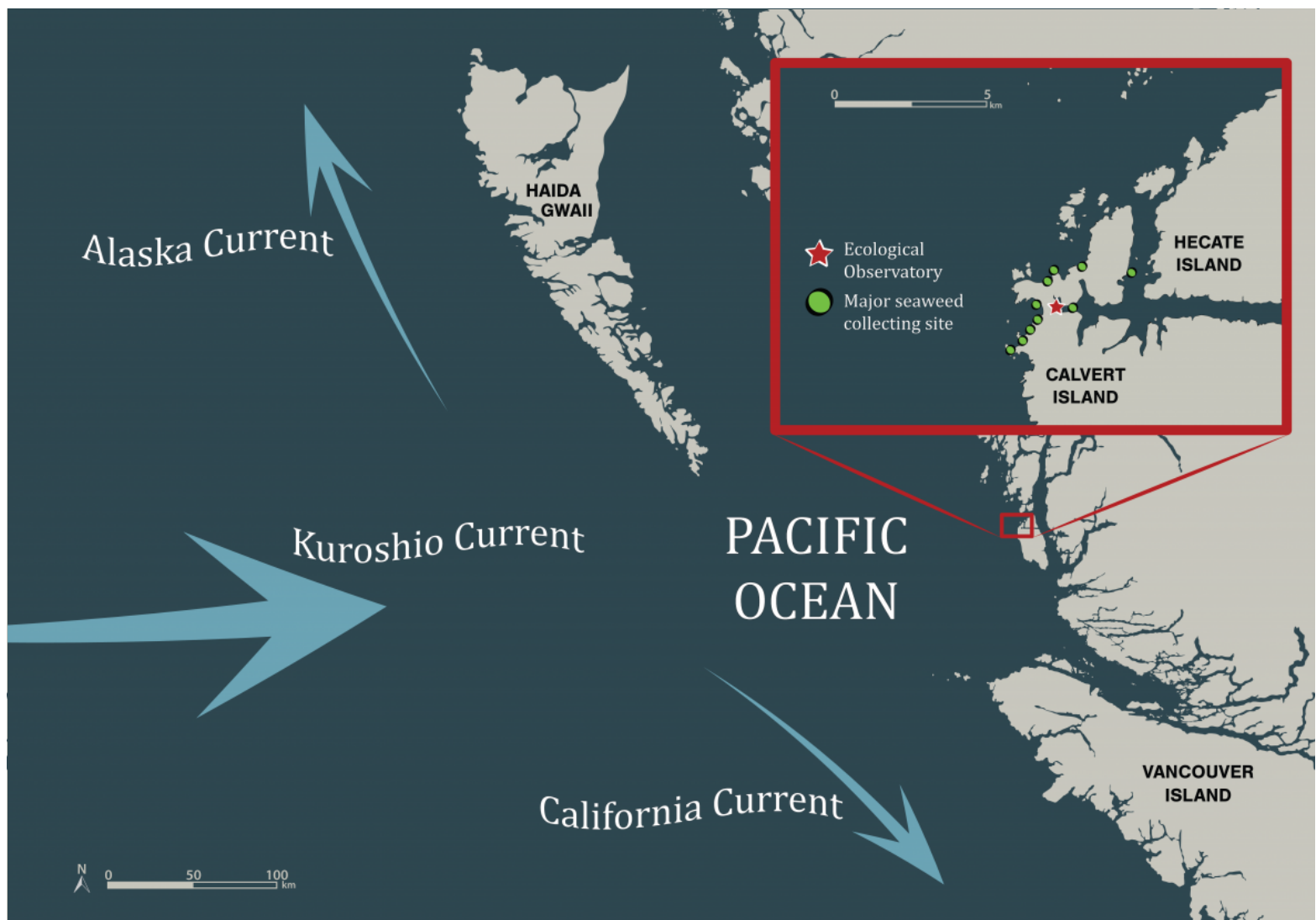
Photo by Patrick Martone

Another diversity surprise came from plumes of elongated filaments within the genus *Acrosiphonia*. These unassuming green seaweeds are informally called Grinch fingers by Martone because they resemble the wispy digits of Dr. Seuss' eponymous cantankerous character. Based on how they look in the field, Martone generally only applies one or two scientific names. But DNA barcoding revealed what even a trained eye can't see at first glance—so scientists return to the pressings for closer inspection.

“These cryptic species get totally overlooked,” says Martone. “Once we sequence the DNA then we look back at the pressed specimens again to see if there are any morphological differences or habitat details we can use to tell them apart.”

Once DNA bins the collection into species, similarities and differences may more easily come into focus. Maybe species A is more cylindrical. Or species B only grows near seagrass meadows. These yet-unnamed cryptic seaweeds cause the area's species list to swell.

On Calvert Island, the diversity is, in part, tied to the powerful ocean currents coming from the north, south, and west. Some new seaweed finds are typically southern species extending their range north, while others are colder water species previously only found in Alaska. And then there's the species of green that came from even farther afield—over 7,000 kilometers across the Pacific. Resembling a clump of moss-colored dog hair, *Cladophora opaca* is a Japanese seaweed that showed up on Calvert Island in 2017.



Map of important ocean currents and major seaweed collecting sites on the northwest coast of Calvert Island. Map by Josh Silberg

"It was totally out of the blue. This seaweed has never been reported from North America before," says Lindstrom, who adds that there's no evidence that its presence was tied to debris associated with the 2011 Tōhoku tsunami. Instead, it may have come over attached to a ship's hull, rafting on a log, or as a tag along with oyster spat.

And after a decade, when do the scientists think they'll stop finding new species to add to the list?

"People ask me every year," says Martone. "I'll say I think we've captured all the diversity and then we find something new."

With a manuscript describing the green algae of Calvert Island out in the journal *Botanica Marina*

(<https://www.degruyter.com/document/doi/10.1515/bot-2021-0038/html>) this week, the scientists can shift their colour focus elsewhere.

In addition to the 42 species of green algae, more than 300 species of red and brown algae have already been found by their team on Calvert Island, so their work is far from over.

“We picked off the easy one,” says a grinning Martone. The inevitability of seaweed surprises is great motivation.

Part of the [Tula Foundation](https://tula.org/) & [Hakai Magazine](https://www.hakaimagazine.com) family



[\(https://www.facebook.com/hakaiinstitute/\)](https://www.facebook.com/hakaiinstitute/)



[/hakaiinstitute](https://twitter.com/hakaiinstitute)



[\(https://www.instagram.com/hakaiinstitute/\)](https://www.instagram.com/hakaiinstitute/)



[/hakaiinstitute](https://www.youtube.com)

[/channel/UCJ9MvNiJdnTlpr1bQIA5Hg](https://www.youtube.com/channel/UCJ9MvNiJdnTlpr1bQIA5Hg)



[/hakai](https://vimeo.com/hakai)

[About](#) | [Privacy Policy](#) | [Contact Us](#)