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Materials Needed

- Nylon mesh citrus fruit or onion sacks, easily found in most grocery stores (4 to 5 sacks needed per collector)
- Spool of nylon rope (we used crab pot line)
- Brick or other heavy object to use as a weight (one per collector)
- Pier or dock from which to suspend collectors

Selection of Deployment Site

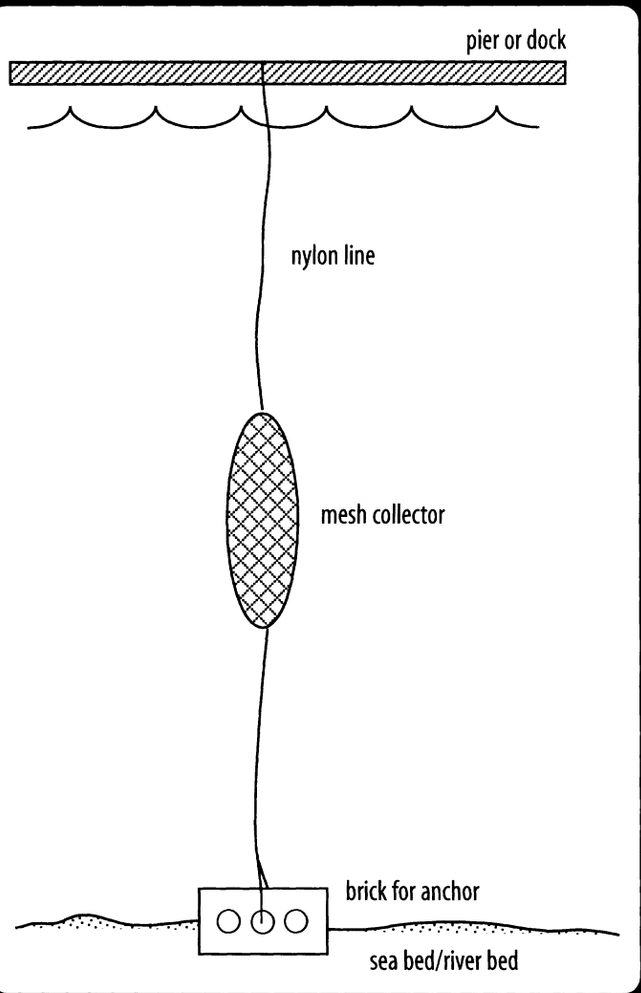
If no pier is immediately accessible to the school, arrangements can be made with a local marine laboratory, university, state agency or private residence with water access to use its pier for deployment of collectors. Note: As a safety precaution, students should wear life jackets while on pier!

Procedure

To construct the critter collector, simply stuff 3 to 4 mesh sacks inside a fifth sack, which creates a settling substrate. At one end of the outside mesh sack, tie a piece of nylon rope which will be attached to the dock (Figure 1). At the other end of the sack, secure another piece of nylon rope and attach the free end to a brick. This end will serve as an anchoring device and will keep the collector submerged. The length of the ropes depends on factors such as height of pier above the water, depth of water, and desired depth of collectors. Length of deployment will depend on the field activity being conducted (see "Field Experiments" below). Once a bacterial film forms on the surface of the collector (which may take a week or more), the collector is primed for colonization. The collectors will be colonized by the planktonic larvae of sessile organisms, which typically live in the water column for a period of days to weeks. Once the larvae find a suitable substrate (such as your collector!) they settle, metamorphose, and grow rapidly into lush fouling communities. Adult forms of motile species will also be attracted to the collectors, either in search of a meal or as a place to hide from predators.

To retrieve samples, simply hoist the collector out of the water by pulling on the rope attached to the pier. Collectors can become very fouled, especially those that have been deployed for a long period of time, and might require the strength of more than one person to retrieve. Gloves should be worn to protect hands from rope burns and sharp organisms such as barnacles and mussels. Bring the whole apparatus on deck (including the weight) and submerge the collector in a bucket of salt water. Shake the collector to dislodge all creatures into the bucket. Forceps might be required to remove the more stubborn creatures. Once the organisms are removed, the collector can be redeployed or removed from the pier.

FIGURE 1.



Schematic diagram of collector deployment from a pier

Suggested Activities

Live Specimens for Zoology Labs—even if your school isn't located directly on the waterfront!

We successfully used this device to collect a diverse array of specimens for undergraduate zoology labs at The College of William and Mary (Table 1). On the morning before the lab, we simply removed species from collectors deployed at the Virginia Institute of Marine Science (approximately 17 miles or 27 km

TABLE 1.

Organisms collected on our artificial substrates deployed in the York River estuary, Virginia 1994-2000.

Phylum Porfiera	
	Boring sponge, red beard sponge
Phylum Cnidaria	
	Anemones
	Hydroids
Phylum Bryozoa	
Phylum Platyhelminthes	
	Flatworms
Phylum Mollusca	
	Bivalves (soft clams, oysters, mussels)
	Gastropods (nudibranchs, oyster drill snails)
Phylum Arthropoda	
	Isopods
	Amphipods (skeleton shrimp, scuds)
	Decapods (juvenile blue crabs, mud crabs, grass shrimp)
	Barnacles
Phylum Annelida	
	Polychaete worms (clam worms, fan worms, scale worms)
Phylum Chordata	
	Tunicates (sea squirts)
	Fish (gobies, blennies, skilletfish, juvenile oyster toadfish)

from campus) and transported them to the college in 5-gallon buckets. Students enjoyed working with live specimens, and were able to observe first-hand many of the body plans and ecological adaptations about which they were leaning. We also collected specimens for outreach program demonstrations up to 1.5 hours away from our school. To ensure organism survival during transport over long distances or in warmer months, a battery-operated aerator (available at most bait and tackle shops) should be used to maintain adequate dissolved oxygen levels in the container.

Field Experiments

- *Recruitment/seasonal succession of species.* Deploy collectors throughout the year, and every month (or at least once per season) collect a sample and have the students identify the species. Do the species change throughout the year? Does diversity or species richness change? If so, ask students to discuss why. This field study could lead to laboratory experiments that further investigate effects of environmental factors on the resident species (changes in growth with temperature, for example).
- *Effect of location on epifaunal species.* Place collectors in different habitats (for example: suspend collectors at different depths in the water column, in different current regimes, or even in different bodies of water). Is there any effect of habitat difference on species distributions?

Conclusion

This article describes how to create and deploy an inexpensive collecting device for marine and estuarine epifauna. Retrieval of these devices does not require boats, SCUBA, or even that the scientist gets wet! Organisms collected can be used in classroom demonstrations (a cheap alternative to ordering organisms from biological supply companies) and their settling patterns can become the basis for ecological inquiries.

Acknowledgments

We would like to thank Vicki Clark and Giancarlo Cicchetti for encouraging us to develop our epifauna outreach activity. Funding was provided by the Outlook on Ocean Science Program, sponsored by the Virginia Institute of Marine Science, Virginia Sea Grant Marine Advisory Program, and DuPont. VIMS contribution number #2351.

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