Doing Socially Engaged Science

By Jouni Taskinen

Photo Fabio Cito

The day at the Mustio beach is full of action. As soon as I unloaded my car, the pupils started to arrive. My goal was clear, there has to be meaningful work for the kids and we have to demonstrate the filtering activity of mussels. After exposing the mussel collection gear and aquascope, my job got pretty easy—these pupils did not hesitate to start working. When they heard that the task is to locate and collect mussel, they were full of enthusiasm.


Photo Fabio Cito

One group started searching mussels visually, using naked eye and aquascope. They scan the shallow water, first without success, but they learn quickly to explore the more sheltered areas where the swimmers usually do not wander. Finding the first “own” mussel makes them feel good. It also makes the other groups to intensify their efforts.

After my short introduction, the second group grab a bottom dredge, a metal frame attached with a net, connected to a rope. The dredge will be pulled on the bottom, so that the metal ‘wings’ should detach mussels and they fall into the net. Managing this equipment requires co-operation. Soon the dredge group works in a coordinated manner. One pupil holds the rope while others carry the dredge to a suitable position. Then the whole group pulls the rope. When dredge bites bottom sediment, it becomes heavy. They have to ask help from other groups. Eventually almost the whole class is pulling, but only mud is caught. But after a while the kids learn how far and where the dredge should be carried, or thrown. Quite short pulls perpendicular to the shore start to give nice catch.

The third group was quickly self-organized; a group of boys with snorkles, mask and fins. Maybe they already knew how to find mussels. They were diving around the deck like seals, and they were effective.


Photo Fabio Cito

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Mussels started to pile up on the shoreline. Some of the pupils formed the fourth group who took care of the catch. They dug holes to the sand, underwater, in clearly separated areas for each of the collecting groups. Soon there appeared sub-holes with different looking mussels—do we have different species here? Mussel were also categorized by their size—small ones, large ones.

After about 45 minutes, mussel collection was ended and the catch was counted. Pupils had collected altogether 94 mussels in a short period of time. There must be thousands of mussels around this swimming beach. Seventy five individuals (80%) were painter's mussels and 21 (20 %) duck mussels. However, there was a clear difference in the species distribution with respect to water depth. All the mussels from the shallow water (11 individuals) were duck mussels. In contrast, duck mussels (8 individuals) represented only 10% of the mussel community in the deep water. Deep area was

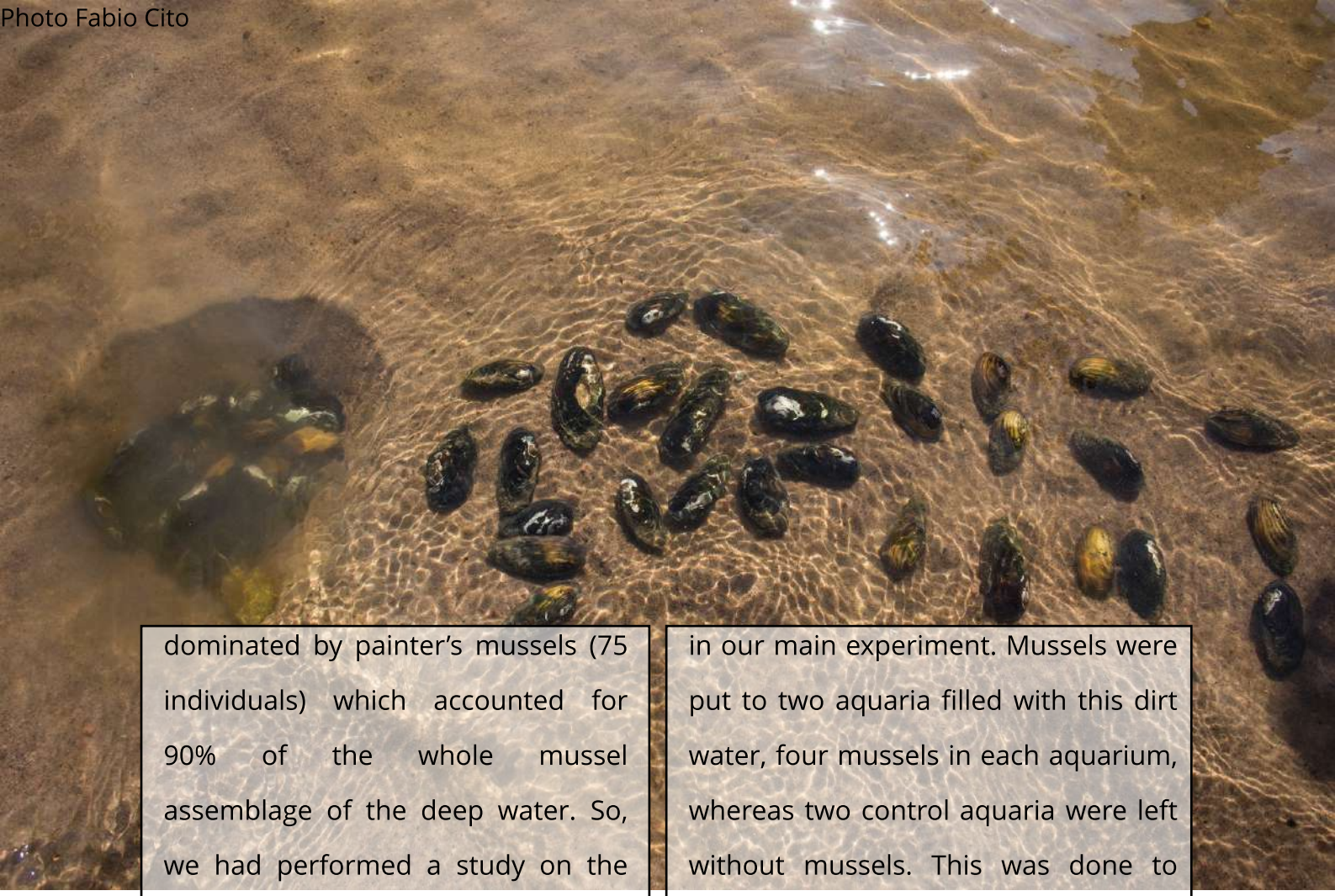
Photo Fabio Cito

dominated by painter's mussels (75 individuals) which accounted for 90% of the whole mussel assemblage of the deep water. So, we had performed a study on the habitat dependence of mussels, showing that duck mussels prefer shallow water while painter's mussels dominate the deep water.

But the most important part was now about to start. Together with pupils, we filled small aquaria with dirty water. When holding and counting the mussels, some of the mussels were kept in a bucket half full of water and actually washed there in order to see the annual rings on the shell (rings that form during winter when mussels stop growing). This 'dirt' water was used in our main experiment. Mussels were put to two aquaria filled with this dirt water, four mussels in each aquarium, whereas two control aquaria were left without mussels. This was done to demonstrate the filtering effect of mussels. Our expectation was that mussel would filter the dirt and clean the water.

When the experiment was started, all the mussels (except for those eight mussels, which were in aquaria) were returned back to the river. Then we let the experimental aquaria to stay away from direct sun light, on the rail of the changing room building.

After 2-3 hours, we come back to see what has happened. The result was very clear. Water in control aquaria, those without mussels, was the same

as in the beginning of the experiment, dirty and turbid. One cannot see through it. But the water in mussel aquaria was clean and transparent. This demonstrates the function of freshwater mussels in our rivers and lakes. They filter water for food and, consequently, they clean the water.

It was time to release the final mussels back to River Mustionjoki. I think the pupils may have learnt a couple of important things about freshwater mussels today. First, we may have a dense mussel bed in front of use—or below us—even though we frequently do not see them. Second, mussels really help to keep the water clean. We could not see the endangered freshwater pearl mussel, *Margaritifera margaritifera*, but we all agreed that it is important to act to save this magnificent species from extinction in River Mustionjoki, the southernmost river in Finland housing the freshwater pearl mussel. Some of the pupils may also remember that their river, Mustionjoki, accommodate all of the seven freshwater mussel species that are found from the whole country. The pupils know that their river is unique, truly exceptional.

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