**The Spotted Salamander – The Only Photosynthetic Vertebrate**

Vernal pools are typically isolated; no flowing water feeds them. This makes the level of dissolved oxygen low. Even though larval amphibians have gills to take oxygen from water, they often need to swim to the surface to grab gulps of air—especially in warm weather, when water holds even less gas.

Spotted salamander eggs need oxygen as well, but they cannot rise. They are submerged in the pool, attached to underwater vegetation, and coated in a thick layer of clear egg jelly that helps protect them from predation. How do they get enough oxygen?

Here is a clue to the answer: some spotted salamander egg masses are green. A unique species of algae grows in the egg jelly. Theirs is a mutualistic relationship, or symbiosis. The algae get a safe, nutrient-rich place to grow. In return, as they photosynthesize—or use sunlight to make sugar—they release oxygen to the embryos inside the egg mass.

Recent studies show that algae not only grow in the egg jelly, but even enter the cells of larvae. Eventually they migrate with adult salamanders into the forest! This means that spotted salamanders are the first known vertebrate that can photosynthesize.

Submitted by Hannah Bement