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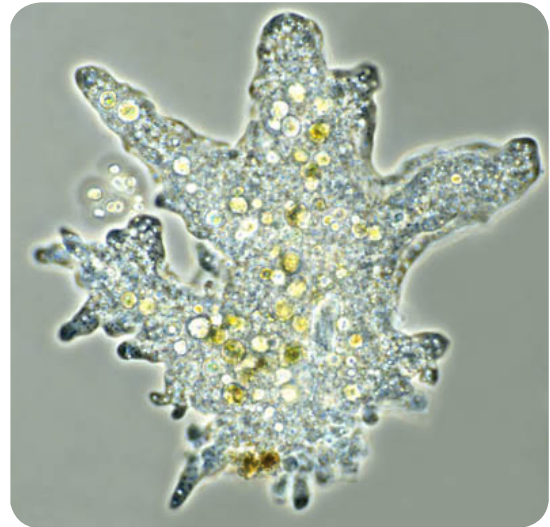
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Reproductive Strategies

Animal Profile:

AMOEBA (*Amoeba proteus*)

Take one look through a microscope at a drop of healthy pond water and you'll find a ton of one-celled organisms zooming about. Some of these cells move by fluttering tiny hair-like cilia, while others are propelled by large whip-like flagella. You'll also come across a lot of blobby cells creeping about and engulfing other cells by extensions of their bodies. These one-celled critters are known as amoeba, and they move and feed by extending bulges called pseudopodia (false feet). When an amoeba moves, it reaches pseudopodia away from its edges and anchors them at their tips. The rest of the cell's insides stream into the pseudopodia until the entire amoeba has slurped into a new location.



Steve Durr

Amoeba proteus with several green algae trapped inside food vacuoles.

Amoebas are found all over the place, from oceans to soil. They play a very important ecological role by making meals of the huge number of bacteria, algae, and small protists found on this planet. One common amoeba is the giant amoeba, *Amoeba proteus*. Giant amoebas reproduce by binary fission, a fancy word that means splitting in two. When a giant amoeba begins to divide, it pulls its pseudopodia in to form a kind of ball. After its nucleus doubles, the amoeba constricts in the middle, as if a belt were being pulled tighter and tighter around the cell. Finally, the two new cells pinch apart, send out pseudopodia, and slink away from each other. In this way, two identical "daughter" cells are created from one. When conditions are right, this amoeba can divide every 48 hours.

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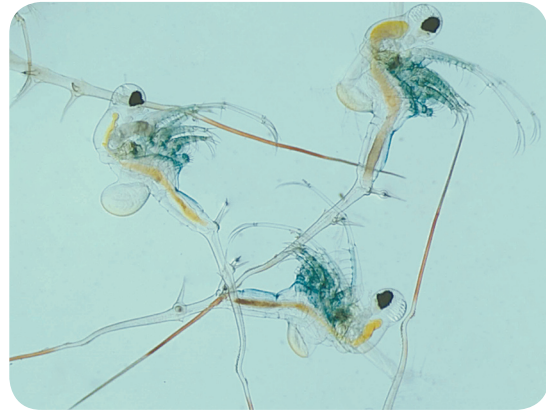
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Reproductive Strategies

Animal Profile:

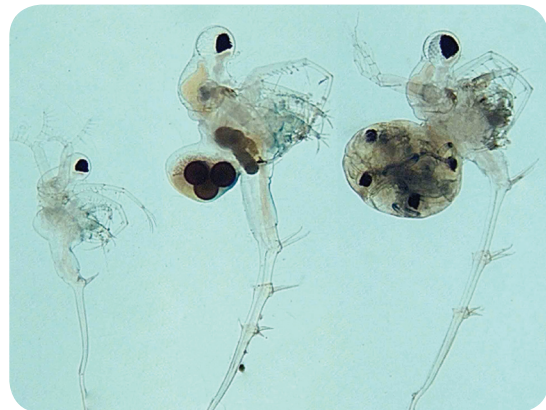
SPINY WATER FLEA (*Bythotrephes longimanus*)

There's a tiny, transparent crustacean that swims jerkily around in the Great Lakes. It spikes fish in their mouths with its long tail and gobbles up other microscopic aquatic animals (zooplankton). It's called the spiny water flea, but it's more related to crabs and lobsters than to any insects. Though many different kinds of water fleas are common in ponds and streams, the spiny water flea is not a welcome visitor. It's an invader from European waters and it competes with local fish and water fleas for food. It's protected from predators by its nasty barbed tail, which makes up 70% of its 2 cm long body.



Pieter Johnson, University of Colorado at Boulder

Spiny water fleas are a threat to ecosystems because of their power to rapidly reproduce. Like all water fleas, this one alternates between asexual and sexual phases. Most of the time, a female produces eggs without fertilization. She releases about 10 eggs into the brood chamber on her back, where they develop into young clones within several days. During summer, females can produce clones of themselves every 2 weeks.



Pieter Johnson, University of Colorado at Boulder

Different reproductive forms of spiny water fleas. Male (left), female with asexual eggs (center), and female with sexual eggs (right).

When food becomes scarce or temperatures change, some females produce spiny little males. These males mate with other females that have produced special eggs used for fertilization, called "resting eggs." They're called this because after these eggs are fertilized, they leave the mom and remain dormant before hatching. Many water flea resting eggs can survive drying or being eaten by fish.

Spiny water fleas seem to have a lot on their side, and they're in the Great Lakes to stay. Still, biologists are working hard to keep them from spreading into too many more lakes in the future.

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Reproductive Strategies

Animal Profile:

BLUE-HEADED WRASSE

(*Thalassoma bifasciatum*)



Adult male Blue-Headed Wrasse

Many animals are born male or female and stay that way for the rest of their lives.

Not so with the blue-headed wrasse, a tropical fish that darts about amongst the corals and sponges in shallow Caribbean waters. Females of this fish can completely transform into males when the conditions are right.

Blue-headed wrasses, like many reef fish, are small and brilliantly colored. Most of them - young males and females - are yellow and sport a greenish-black stripe on their sides. The others - the few, the proud, and the powerful - are older males with showy blue heads, green bodies, and thick black and white stripes around their collars.

Big blue-headed males defend territories around the reefs, where they strut their stuff until the smaller yellow females find them attractive. When this happens, the female swims with the male and spawns (releases her eggs). The male quickly fertilizes them with his sperm before they float away into the ocean. Blue-headed males can mate with as many as 100 females per day!



Virginia O. Skinner

Adult female or young male Blue-Headed Wrasse

Of course, these big males can lose their territories because of nasty little things like death and rivalry. When that happens, the largest yellow female in the area may morph into a blue-headed male and begin defending a territory. So, some of the blue-headed males were born male, while others were born female.

For the females that transform into males, this is a great deal. They can get a lot of their genes into the next generation by laying eggs when they are younger, and then fertilizing eggs as males when they're older.



Virginia O. Skinner

Juvenile Blue-Headed Wrasse