


Video: Carnivorous Bladderworts Catch Meals With Vacuum Power

By [Daniel Strain, Science News](#)  February 16, 2011 | 4:30 pm | Categories: [Biology](#)

Carnivorous bladderworts trap prey with speed that would make a Bond villain shudder in gleeful envy.



Using high-speed cameras, researchers have gotten the first good look at how these underwater plants spring their ambushes. Bladderworts sport trap doors that buckle in with a tiny nudge, creating a whirlpool that sucks in wee critters — all in about half a millisecond. That’s some of the fastest plant action on Earth, a French and German team reports online February 15 in the *Proceedings of the Royal Society B*.

Forget Venus flytraps. Bladderworts of the genus *Utricularia* are really cunning meat eaters. “*Utricularia* are the smallest of carnivorous plants and also, evidently, the most sophisticated,” says Lubomír Adamec, a plant physiologist at the Academy of Sciences of the Czech Republic. These netlike veggies are dotted with tiny traps, often no wider than an ant is long.

Small or not, the traps are masterpieces of suction. Pumped nearly dry, the chambers set up a pressure difference between the plant’s innards and the water outside. When swimmers brush up against a series of hairs along the trap door, the door bursts open and sucks water and crustaceans alike in.

Despite decades of interest in these nefarious plants, botanists couldn’t say for sure how the traps worked. Bladderworts were just too quick for old-school cameras. But with fancy new high-speed cameras, biologists can get their close-ups, says Adamec.

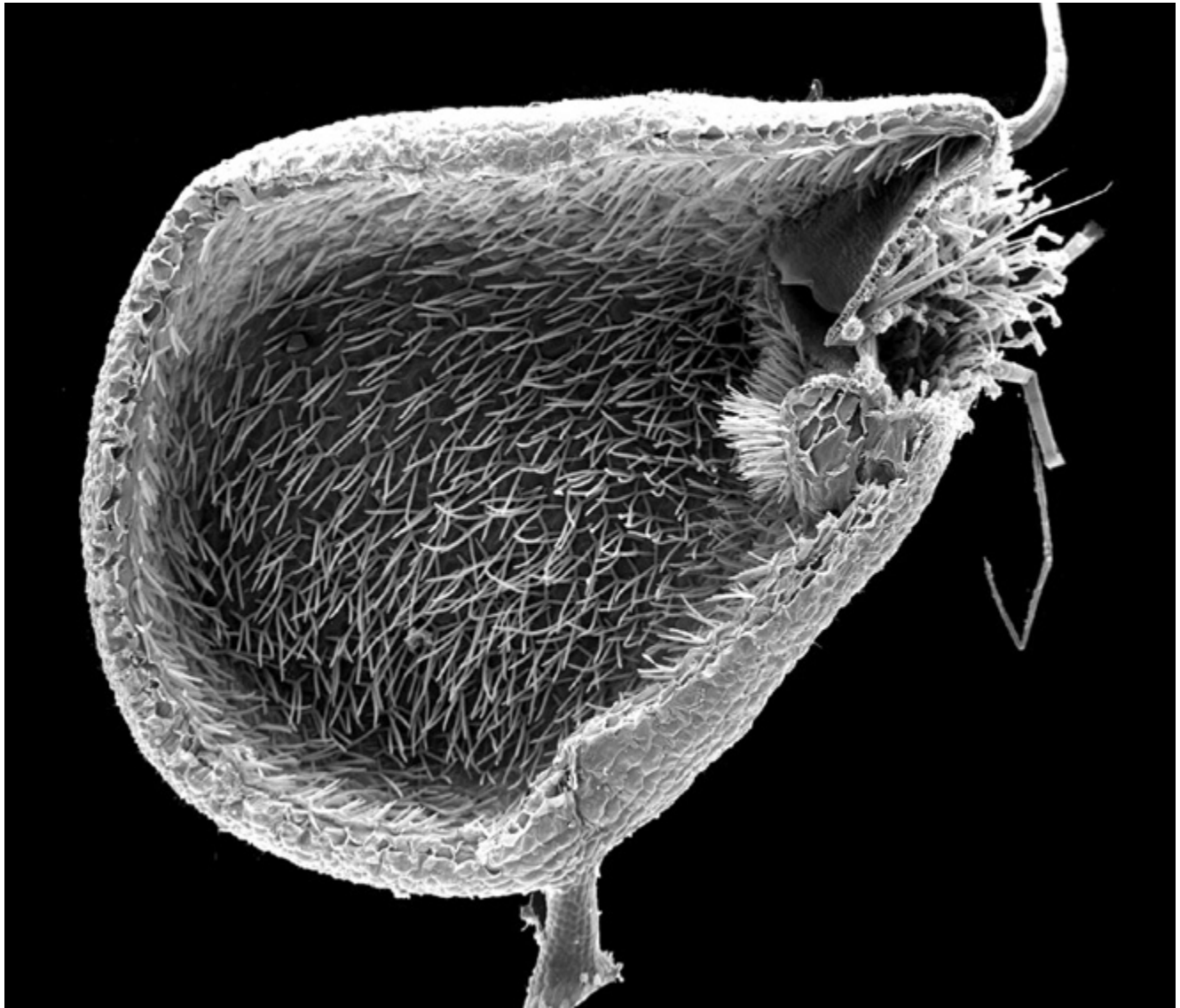
It looks, at least in three bladderwort species, like the traps spring using an elastic buckle. At just the right pressure, the domelike trap door stays shut. But then, a tiny touch collapses the door like a popped bubblegum bubble, opening a small window to the trap below. But unlike a gum bubble, the doors are bouncy and spring back to their original shape in fractions of a second, says study coauthor Philippe Marmottant. “This kind of change of shape is very abrupt,” says Marmottant, a physicist at Joseph Fourier University in Grenoble, France. The quick pop pulls water in with tiny swirls that move at speeds up to about 3 miles per hour.

Physicists had already predicted such a buckling trap in 2005, but this study gives a good look at it in action, says Victor Albert, a biologist at the University at Buffalo in New York. Carnivory isn’t a trivial thing for these plants, either, he says. As meat eaters, these plants flourish in rough and strange habitats from swamps to the insides of bromeliads, bowl-shaped tropical plants. “They’re just crazy,” he says.

And maybe crazy useful, Marmottant says. As a physicist, he’s less interested in ecology than in the flow of liquid in very tiny environments. And bladderworts move fluid so well, he says, they could inspire new lab tools like pipettes. These tools, which pick up and spit out tiny drops of liquid, are

important in the biotech industry. “Bladderworts act like a small pipette,” he says. “This could be used in miniature devices.”

Still no word, however, on whether they can trap rakish British agents.



Video: Philippe Marmottant.

Image: Many a small crustacean met its end in this bladderwort trap, seen here in a close-up. Now, scientists have a much better idea about how these devious chambers work. (Carmen Weißkopf)