and costly process called regeneration. A 1996 survey of 151 countries by the U.N. Food and Agriculture Organization (FAO) found that many facilities were rapidly deteriorating and had a large backlog of samples needing regeneration. A follow-up survey in 2000, analyzed by Chris Higgins and colleagues at Imperial College London, U.K., concludes that "the situation has gotten worse," says Geoffrey Hawtin, director of the International Plant Genetic Resources Institute in Rome, Italy.

For Enrique Suárez, director of the National University of Agricultural Technology's main gene bank, in Castelar, Argentina, that means insufficient staff to regenerate samples. And the recent devaluation of the peso has left him too poor to buy specialized sample bags to refrigerate some 30,000 samples awaiting curation. "The work at the gene bank is stopped," he says. "It's very frustrating." Plant samples are stacking up in two-thirds of the countries surveyed, and the budgets of a quarter of gene banks have been trimmed.

The Global Conservation Trust teams FAO with the Consultative Group on International Agricultural Research, which runs 11 major gene banks. At the summit, the Swiss government ponied up $10 million, but trust officials say they need 10 times that figure before they will solicit proposals.

Uncertainty about the governance of the trust could spell trouble, warns Pat Mooney of the ETC Group in Winnepeg, Canada, which defends the rights of farmers in developing countries. Some governments might misconstrue the endowment as a way for industrialized countries to gain control over germ plasm resources, he cautions. "What worries me a lot is that it will open a wide vista for agribusinesses to serve their own purposes," says Melaku Worede, an agricultural consultant based in Addis Ababa, Ethiopia. But the trust's Ruth Raymond says that developing countries will have a voice in the trust's governance structure, and that several countries are interested in contributing. —ERIK STOKSTAD

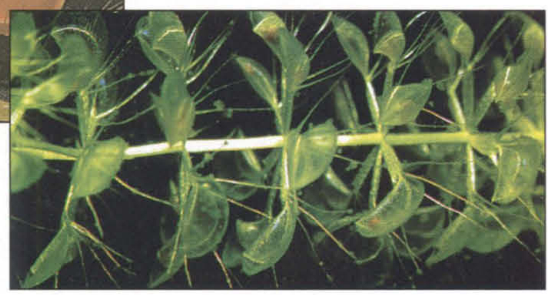
PLANT EVOLUTION

Elaborate Carnivorous Plants Prove to Be Kin

The Venus flytrap has a muddled family history. Charles Darwin thought this elegant bug eater from the southern United States had close ties to a European aquatic weed called the waterwheel. A century later, researchers decided that the waterwheel's closest kin was not the Venus flytrap but the terrestrial sundew, which also dines on insects. Now a DNA analysis of these botanical carnivores suggests that Darwin's hunch was right after all.

In many ways, this revised family history makes sense, comments Mark Chase, a plant systematist at the Kew Royal Botanical Gardens in Surrey, U.K.—even though he once suggested otherwise. Of all the plants that feast on animals, waterwheels and Venus flytraps "have taken carnivory to the extreme," he notes: Each has leaves reshaped into traps that snap shut. Now that their close relationship is "nailed down, it sets the stage for people to ask more intelligent questions about how these mechanisms evolved," Chase points out.

Carnivorous plants have come up with a variety of ways to snare their prey: pools of water for drowning unlucky visitors, sticky surfaces that work like flypaper, or "snap traps" that clamp down on morsels in milliseconds. Sundews are flypaper predators; waterwheels and Venus flytraps depend on snap traps. All use their prey not as a food source but to provide minerals.



Family ties. DNA studies reveal a close relationship between the Venus flytrap (*top*) and the waterwheel (*right*).

Evolutionary biologists have long speculated about how these features evolved. In the late 1800s, Darwin picked up on similarities in the stamens and pistils—a flower's reproductive parts—of waterwheels and the Venus flytrap and suggested that these two plants were closest kin. However, in the early 1990s, Chase and his colleagues threw a fly in the ointment, so to speak, when they compared the DNA of about a dozen carnivorous plants and took a closer look at their morphology. They had no DNA from waterwheels and so relied solely on morphology (*Science*, 11 September 1992, p. 1491).

The 20th century study led researchers to conclude that they should lump the sundew in with the waterwheel and push the Venus flytrap out of the tight-knit group. This family tree had evolutionary implications, says Richard Jobson, a plant systematist at Cornell University in Ithaca, New York. Snap traps might have evolved twice, once in the waterwheel and once in the Venus flytrap. Alternatively, the alignment could mean that a snap-trapping ancestor gave rise to sundews, in which case the less elaborate flypaper traps represented simple, modified snap traps.

Now a 21st century DNA analysis tells a different evolutionary story. Jobson, Kenneth Wurdack, a plant systematist at the Laboratories of Analytical Biology of the Smithsonian Institution in Suitland, Maryland, and Kenneth Cameron of the New York Botanical Garden have compared four genes instead of the one studied in the 1990s. They conclude that even though the Venus flytrap is terrestrial and the waterwheel aquatic, the world's only two snap-trapping plants are nonetheless siblings. The sundew is no closer than a cousin, sharing a common ancestor much earlier in time, the group reports in the September issue of the *American Journal of Botany*.

Cameron and his colleagues contend that this evolutionary arrangement suggests that snap traps evolved only once. Moreover, "our results demonstrate that snap traps evolved from flypaper-trapping plants," he says. They also think that among snap-trappers, the Venus flytrap came first.

Chase thinks the snap-trap story might be more complicated than it now looks. The two species "don't live in the same parts of the world," he explains, and although fossils show that the waterwheel was once common throughout Eurasia, the Venus flytrap is known to grow only in North and South Carolina. That leaves open the question of where the snap-trap plants got started and how they spread. —ELIZABETH PENNISI

INFLAMMATORY ARTHRITIS

How Immune System Gangs Up on Joints

Mast cells are best known for releasing the dastardly allergy compound histamine, which induces sniffles and swollen eyes. Now rheumatologists have found the troublemaker cells embroiled in another dysfunctional immune system activity: inflammatory arthritis. On page 1689, David Lee of Harvard Medical School in Boston and colleagues report that mast cells in mice act as a bridge linking arthritis's self-attacking antibodies and the inflammation that swells joints.

It took time to accumulate evidence on the suspects. "There are 20 years of literature documenting mast cells in human inflammatory

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