Discovering the sexy side of valued fungi

Soil fungi of the genus *Trichoderma* have numerous commercial applications. Clothing manufacturers use the cellulose-degrading enzymes produced by the fungi to give jeans a "stone-washed" look. Some household laundry detergents contain such enzymes to help remove fabric nubs. Farmers employ *Trichoderma* to attack fungi that harm crops.

Like most commercially valuable fungi, the available strains of this workhorse reproduce only asexually, which makes selective breeding impossible. But researchers now report finding sexual variants.

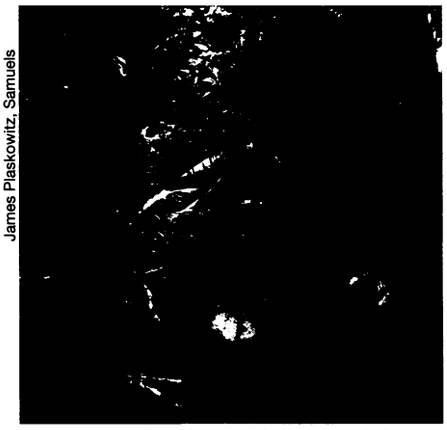
Scientists recently collected from Puerto Rico and Uganda samples of fungi identified as the rare *Hypocrea poronioidea,* last collected and studied at the turn of the century. This fungus reproduces sexually and can be grown in the laboratory.

Although the two fungi don't look alike, DNA and enzyme analyses suggest that *H. poronioidea* is actually the sexual version of a *Trichoderma* species—but which species remains unclear, report Gary J. Samuels of the U.S. Department of Agriculture's Agricultural Research Service (ARS) in Beltsville, Md., and D.J. Lodge of the USDA's Forest Service in Palmer, Puerto Rico, in an upcoming MYCOLOGIA.

Fungi commonly have sexual and asexual variants, which can go by different names. Samuels and Lodge observe that *H. poronioidea* generates both sexual and asexual spores. The asexual spores develop into *Trichoderma.*

Other genetic studies suggest that a well-known fungus called *Hypocrea jecorina* may be the sexual version of another *Trichoderma* species, *T. reesei*, contend Samuels, Adrian Leuchtmann of the Swiss Federal Institute of Technology in Zürich, and Orlando Petrini of Pharmaton in Bioggio, Switzerland. Their work is scheduled to appear in MYCOLOGIA later this year.

Manufacturers use a strain of *T. reesei* collected from a cotton tent on a South Pacific Island during World War II, says Amy Y. Rossman of ARS. The new studies will allow researchers to improve commercial strains through selective breeding, speculates Samuels.



James Plaskowitz, Samuels

H. poronioidea *fungus (inset) and the Brazilian rain forest, where it grows.*

Having these sexual fungi should help scientists classify *Trichoderma*, which has proved difficult, says Gary E. Harman of Cornell University's New York State Agricultural Experiment Station in Geneva. Correctly identifying fungi is important for securing patents on their uses. However, selective breeding will be possible only between sexually compatible strains, he notes. — *T. Adler*

Tots show signs of intentional minds

Each of us constantly makes assumptions about what other folks believe, want, and feel. Now, a new study shows that these inferences about our compatriots' mental states may have developmental roots in the first year of life.

By about age 1, infants tend to attribute positive or negative intentions to self-propelled objects that pursue simple goals, assert David Premack and Ann James Premack, psychologists at the National Center for Scientific Research in Paris, France.

This suggests that infants have an inherent capacity for discerning such intentions in the goal-directed actions of their parents or anyone else they observe, argues David Premack.

The researchers studied 56 infants, age 10 months to 15 months, at two middle-class nurseries in Paris. At first, each youngster sat in front of a computer monitor and watched one of four brief, animated scenes. In these, a gray ball follows and either hits or gently rubs against a black ball seven times, or a black ball moves up against a narrow open space in a vertical line and either gets pushed away from or through the space by a gray ball. The balls interact "negatively" in the hitting and blocking scenes and "positively" in the rubbing and helping scenes, the researchers hold.

During repeated presentations, infants looked at an initial scene for progressively shorter spans of time, indicating that they lost interest in familiar material. They then saw a second scene. Youngsters shown first a positive and then a negative interaction, or vice versa, displayed large rebounds in the amount of time they gazed at the spheres in action. Time spent looking remained low if the second scene matched the negative or positive thrust of the first one.

So, for instance, infants avidly watched the helping scene after viewing one ball pummel the other but showed no interest in the helping scene after seeing one ball caress the other.

These responses support the theory that infants possess a basic knowledge about intentional actions, the investigators assert in a report accepted for publication in COGNITION.

Nonetheless, only older children, beginning between age 3 and 5, understand that others may hold distinct mental states, such as false beliefs (SN: 7/17/93, p. 40). "A major question is how the transition occurs from basic intentional knowledge to an understanding of mental states," David Premack contends.

"The notion that infants have inherent types of knowledge about the social world is beginning to attract scrutiny," notes Alan M. Leslie, a psychologist at Rutgers University in New Brunswick, N.J. "The Premacks' new findings are suggestive and should lead to further research." — *B. Bower*

Compound may cause wasting seen in cancer

Cancer kills, but often in more subtle ways than one might imagine. Large tumors can savagely destroy organs, yet small tumors may cause a wasting of the body that leaves patients too weak to fight pneumonia and other illnesses.

Now, investigators working with mice have found a compound, apparently made by cancer cells, that causes this mysterious wasting by attacking the body's muscles.

"It produces a syndrome in mice similar to that seen in cancer patients," says Michael Tisdale of Aston University in Birmingham, England.

More important, the compound appears in the urine of cancer patients suffering from the wasting, or cachexia, but not in the urine of other cancer patients or healthy individuals, Tisdale and his colleagues report in the Feb. 22 NATURE.

"It's exciting because they may have found a compound involved in cachexia. The important thing now is for someone to confirm [the result]," says David Kritchevsky of the Wistar Institute in Philadelphia, who helped organize a meeting on cachexia last December.

"If this agent can be established as a key player in cachexia, this would be a major advance," agrees Michael C. Perry, who studies the wasting phenomenon at University of Missouri in Columbia.

Perry notes that about 50 percent of patients have an unexplained weight loss by the time they're diagnosed with