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Fungus Yields Fungicide

By Jennifer Viegas, *Discovery News*

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Feb. 28, 2006 — A fungus would seem to be the last place to find a fungicide, but two separate research teams recently analyzed fungi and successfully identified two potent antifungal substances.

Infections like Athlete's foot and *Candida* that are caused by fungus, which is a parasitic plant lacking in chlorophyll, leaves and true stems and roots, spread easily and are often difficult to cure.

In people with compromised immune systems, such as AIDS patients, fungal infections can be life threatening. Scientists hope the new fungicides will lead to better treatments.

Since the fungicides also target plant molds, they may also lead to safer, more effective fruit and vegetable sprays in future.

For the first study, recently published in the *Journal of Applied Microbiology*, lead author J.Y. Liu and researchers from Nanjing University in China studied marine fungi that reside in a fish called the white croaker, *Argyrosomus argentatus*.

They extracted the fungi from various tissues of the fish and then tested it on the three most common opportunistic human fungal pathogens.

These are *Candida albicans*, which often leads to yeast infections in women; *Aspergillus niger*, which is commonly associated with ear infections; and *Trichophyton rubrum*, which causes "jock itch" and other skin infections.

One fungus from the fish, called *Myrothecium*, successfully wiped out the entire trio of tenacious pathogens.

Liu and his team believe this fish fungus produces a natural poison that slows down protein and nucleic acid production in the pathogens. This likely leads to their eventual demise.

For the second study, published in a recent *Peptides* journal, Hexiang Wang of Beijing's China Agricultural University and co-author T. B. Ng discovered an antifungal protein in the medical mushroom *Ganoderma lucidum*, more commonly known as the Reishi mushroom.

In tests, the mushroom protein wiped out three fungi that commonly cause the gray, green or black moldy rot found on fruits and vegetables. It also cleared up a fungus associated with human fingernail and skin infections.

The findings suggest that in the future, farmers and gardeners might spray a mushroom-derived concoction on their plants to kill and inhibit mold.

According to the Memorial Sloan-Kettering Cancer Center in New York, prior studies found that Reishi increases immune-boosting T-cells in patients suffering from advanced cancer.

The mushroom may also stimulate the immune systems of HIV patients and others, but it can interfere with prescribed drugs, so health care professionals advise that individuals consult with their doctors before taking Reishi.

Christina Martin is an expert in Chinese medicine and acupuncture at Berkeley's Elephant Pharmacy, which offers one of the nation's largest selections of alternative medicines.

Martin told Discovery News that she was not surprised that fungicide could be found in a fungus, since she said Chinese medical practitioners often look to the cause of an illness for its treatment.

"If the research proves to be true, then it will be helpful to us because fungal infections are so difficult to clear up," she said. "Black walnut and tea tree oil are two popular alternative medicine treatments now, but even they do not always

work."

Martin added, "Since Reishi is a mushroom, it is also less scary to us because we are familiar with edible mushrooms.

It is hard for me to say to someone, 'Here is your bowl of Huangqi,' (a root used to treat fatigue) because the individual probably has no idea what that is. Medical mushrooms seem to be more widely acceptable."

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