The turkey tail mushrooms found on dead wood are known by their colorful bands. But did you know these paper-thin fungi might someday help create paper?

# Fungus Fans

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Sometimes, being rotten is a good thing. When it comes to breaking down solid wood into wood pulp for paper production, a little woodland fungus known as *Trametes versicolor* has demonstrated for researchers and the paper industry that environmentally cleaner and energy-efficient paper production might someday come naturally.

The subjects of this month's cover are thin, paper-like mushrooms commonly known as the turkey tail. The undersurface is covered with tiny pores, while the top is banded in variable shades of orange, gray, red or brown (they can resemble a banded turkey tail, hence the common name). Many hikers throughout the woodlands of Illinois have spotted these flat mushrooms on logs or stumps. Often, massive stacks of individual turkey tails can be observed on dead wood, appearing like miniature shelves.

And while these multi-colored fungi aren't edible, their benefit to our forests and humans is both rotten and great. As decomposers of lignin, the "glue" that binds together the cellulose of wood cells, *Trametes versicolor* causes what's known as a "white rot" in dead wood. Ever pick up a surprisingly light piece of dead wood in the forest? Perhaps you noticed that the lightest, rotted wood makes lousy firewood. That's because the highly combustible lignin and pitch have rotted away, leaving behind only the light-burning cellulose.

**As a primary decomposer of lignin in wood, the fungus *Trametes versicolor* is an important "recycler" of our Illinois forests.**

*Trametes versicolor*, the fungus which creates turkey tail mushrooms, is amazingly efficient at selectively dissolving lignin in wood while leaving the cellulose basically intact. For industry, that's an intriguing biological trick. Paper mills today still must expend considerable effort to mechanically and chemically do what comes naturally for *Trametes versicolor*, along with a few other lignin-decomposing fungi. Beginning in the 1950s, paper industry researchers began experimenting with "biopulping," a biological alternative to chemical and mechanical pulping techniques. Small-scale tests showed fungi not only could break down lignin for paper production, in some cases the paper created with biopulping was stronger when compared to paper made through the harsher mechanical and chemical process traditionally used to free the cellulose.

While wood chips inoculated with lignin-rotting fungi produced encouraging results in several experiments, including increased pulp yield and reduced energy costs, converting the world's massive paper mills to fungi-friendly operations isn't yet a reality.

Meanwhile, take a moment to appreciate these small wonders of our Illinois forests. Hunting for turkey tails is always in season.