**Global Challenges/Chemistry Solutions
Our Sustainable Future: White rot fungus boosts ethanol production from corn stalks, cobs and leaves**

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Today’s solution is a fungus that shows promise in the search for a way to use waste corn stalks, cobs and leaves – rather than corn itself – to produce ethanol to extend supplies of gasoline. Scientists studied the use of white rot fungus to break down the tough lignin and related material in this so-called “corn stover” to free up sugars for ethanol fermentation. The research appears in the ACS’ journal *Industrial & Engineering Chemistry Research*.

Here’s lead author Yebo Li, Ph.D., from Ohio State University:

*“Corn ethanol supplies are facing a crunch because corn is critical for animal feed and food. The need for new sources of ethanol has shifted attention to using corn stover, which is the most abundant agricultural residue in the U.S., estimated at 170-250 million tons per year. The challenge is to find a way to break down tough lignin structure in cobs, stalks and leaves – so that sugars inside can be released and fermented to ethanol.”*

Previous studies indicated that the microbe *Ceriporiopsis subvermispora*, known as a white rot fungus, showed promise for breaking down the tough lignin prior to treatment with enzymes to release the sugars. To advance that knowledge, Li and colleagues evaluated how well the fungus broke down the different parts of corn stover and improved the sugar yield.

*“Treating corn stover with the white rot fungus for one month enabled us to extract up to 30 percent more sugar from the leaves and 50 percent more from the stalks and cobs. Because corn leaves are useful for controlling soil erosion when left in the field, harvesting only the cobs and stalks for ethanol production may make the most sense in terms of sustainable agriculture.”*

**Smart Chemists/Innovative Thinking**

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