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Rice industry residues potential for curcumin production by engineered *Saccharomyces cerevisiae*

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The use of curcumin, a polyphenol derived from turmeric, as a fighting cancer drug has been raising significant interest. However, obtaining curcumin-rich preparations can be challenging, and its microbial production provides a promising solution. The use of microorganisms comprises low-cost cultivation methods and fast production cycles. To this end, we have developed an engineered *Saccharomyces cerevisiae* strain that can produce curcumin from simple carbon sources. Curcumin biosynthesis requires several enzymatic steps, including reactions catalyzed by the phenylpropanoid pathway and by type III polyketide enzymes, none of them naturally present in yeast. To enable curcumin production, we introduced the necessary genes into the *S. cerevisiae* genome and confirmed the *de novo* production of curcumin using standard media. Rice production is a major global food industry, and its processing generates large amounts of non-food biomass. Rice residues are rich in cellulose polymer, which can be broken down to obtain free glucose. Our aim is to use extracts from rice residues as the substrate to produce curcumin with our engineered yeast. These extracts also contain intermediates of the curcumin pathway such as ferulic acid, which can enhance curcumin biosynthesis. We performed hydrolysis on rice husk and bran residues to obtain the extracts and quantified the presence of carbon sources, fermentation inhibitors, and curcumin precursors in both extracts. We are currently using these extracts in yeast fermentation for curcumin production.