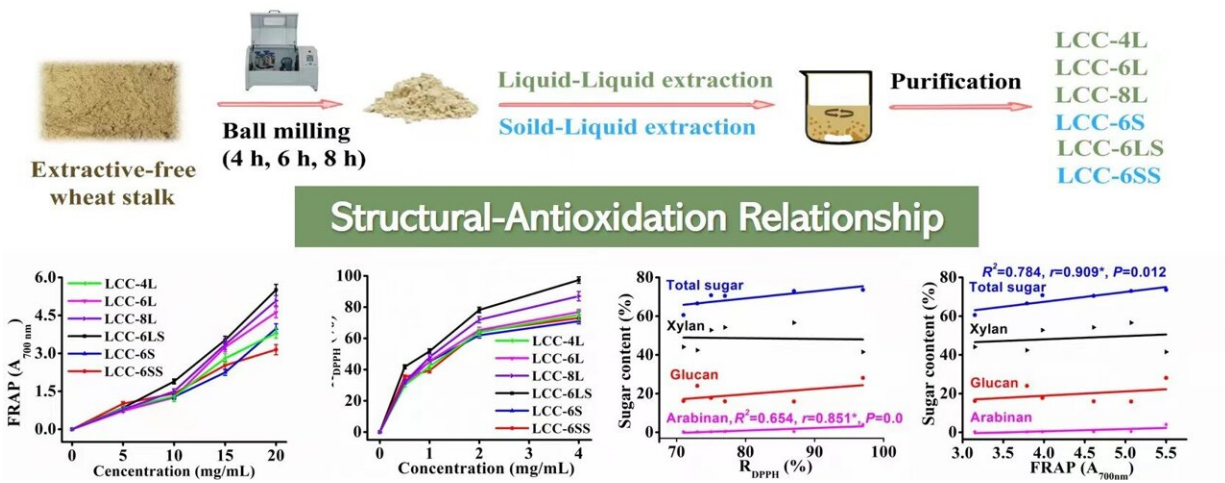


# Enhanced antioxidant activities unveiled in diverse water-soluble lignin-carbohydrate complexes

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Enhanced antioxidant activities unveiled in diverse water-soluble lignin-carbohydrate complexes. Credit: Di Xie, Center for Renewable Carbon, School of Natural Resources, University of Tennessee

A recent study delves into unlocking enhanced antioxidant potential within water-soluble lignin-carbohydrate complexes (LCCs), marked by their rich polysaccharide content. This study underscores the imperative need for advancements in the antioxidant activity of water-soluble LCCs while shedding light on the enigmatic relationship between their structure and antioxidant potential.

The study is [published](#) in the *Journal of Bioresources and Bioproducts*.

Conducted by isolating structurally varied water-soluble LCCs through diverse parameters including ball-milling pretreatment durations, extraction pathways, and isolation routines, the study sought to unveil the structural composition.

Various analytical methods encompassing wet chemistry, chromatography, and spectroscopic techniques were employed to characterize these isolated LCCs. Notably, antioxidant activities were gauged using ferric reducing antioxidant power and 1,1-diphenyl-2-picrylhydrazyl radicals scavenging rate, which reached an impressive 97.35% for water-soluble LCCs, significantly correlated with their arabinan content.

The investigation revolved around elucidating the structure and function dynamics of LCCs, recognizing them as bioactive macromolecules composed of lignin and carbohydrates and showcasing several distinct lignin-carbohydrate linkages.

Previous studies have spotlighted their remarkable antioxidant abilities, making them viable candidates in various applications spanning [health care](#), cosmetics, and functional packaging materials. The high biocompatibility of water-soluble LCCs, attributed to their polysaccharide richness, and their enzymatic antioxidant nature underscore their potential.

In conclusion, this investigation not only uncovers the diverse structural characteristics of water-soluble LCCs but also delineates their nuanced relationship with antioxidant potential.

These findings pave the way for innovative approaches in utilizing water-soluble LCCs as potent natural [antioxidants](#), offering novel insights into

their topochemistry and antioxidant interplay.

**More information:** Di Xie et al, Improving antioxidant activities of water-soluble lignin-carbohydrate complex isolated from wheat stalk through prolonging ball-milling pretreatment and homogeneous extraction, *Journal of Bioresources and Bioproducts* (2023). DOI: 10.1016/j.jobab.2023.11.002 , [www.sciencedirect.com/science/.../S2369969823000749](https://www.sciencedirect.com/science/.../S2369969823000749)

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