Electronic Supplementary Material (ESI) for Green Chemistry.


# Hydrogels with protective effects against cellular oxidative stress via enzymatic crosslinking of feruloylated arabinoxylan from corn fibre

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**Table S1.** Composition of feruloylated arabinoxylan extracted from corn bran by subcritical water

| | |
|---|---|
| **Carbohydrate content (mg/g DW)[a]** | 999.3 ± 32.4 |
| **Ara (%)** | 22.1 ± 0.4 |
| **Xyl (%)** | 52.9 ± 0.1 |
| **Glc (%)** | 12.1 ± 0.5 |
| **Gal (%)** | 6.4 ± 0.0 |
| **Man (%)** | 1.1 ± 0.0 |
| **Rha (%)** | 0.7 ± 0.1 |
| **Fuc (%)** | 0.3 ± 0.0 |
| **GlcA (%)** | 3.1 ± 0.3 |
| **GalA (%)** | 1.3 ± 0.2 |
| **GAX (%)[b]** | 84.5 ± 0.8 |
| **Ara/Xyl[c]** | 0.4 |
| **Soluble protein content (%)[d]** | 2.4 ± 0.2 |
| **Phenolic acid content (mg $g^{-1}$ DW)[e]** | 47.1 ± 0.3 |
| ***p*-coumaric acid (%)** | 4.2 ± 0.1 |
| **Ferulic acid (%)** | 76.7 ± 0.3 |
| **Sinapic acid (%)** | 2.5 ± 0.1 |
| **8-8' di-FA (%)** | 1.6 ± 0.4 |
| **5-5' di-FA (%)** | 5.6 ± 0.1 |
| **Putative di-FAs (%)[f]** | 9.1 ± 0.6 |

[a] Carbohydrate content was determined by HPAEC-PAD after two-step methanolysis [1];
[b] Glucuronoarabinoxylan (GAX) content was calculated based on the total of arabinose (Ara), xylose (Xyl), galactose (Gal) and glucuronic acid (GlcA) composition;
[c] Ara/Xyl is the ratio between arabinose and xylose;
[d] Soluble protein content was determined by the dye-binding Bradford assay [2];
[e] Phenolic acid content was determined after saponification followed by HPLC analysis;
f The unknown di-FAs in HPLC chromatograms were combined as putative di-FAs and their amount was estimated using the response factor of 8-8' and 5-5' di-FAs.

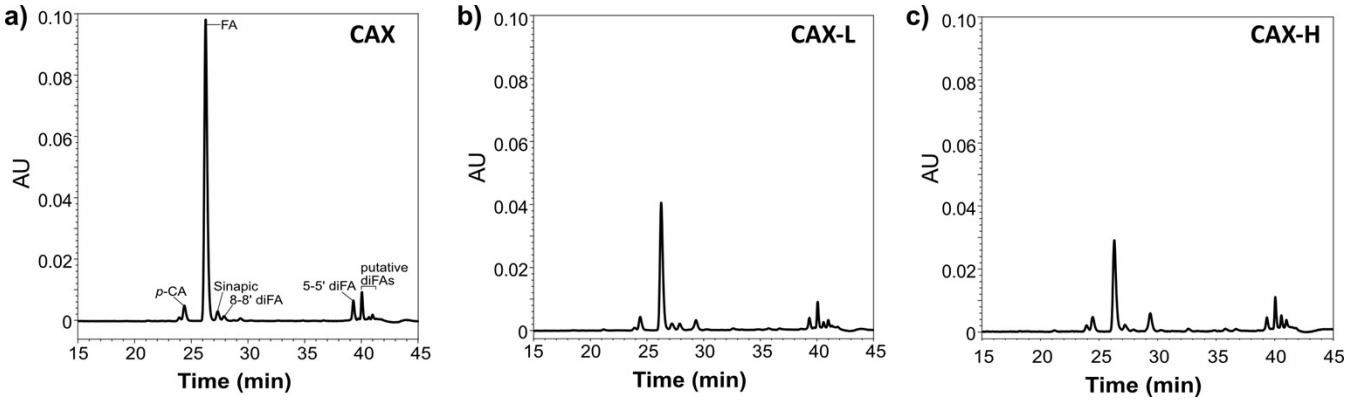


**Figure S1.** Phenolic acid profile of (a) the native (CAX), (b) laccase- crosslinked (CAX-L) and (c) HRP-crosslinked glucuronoarabinoxylan (CAX-H).

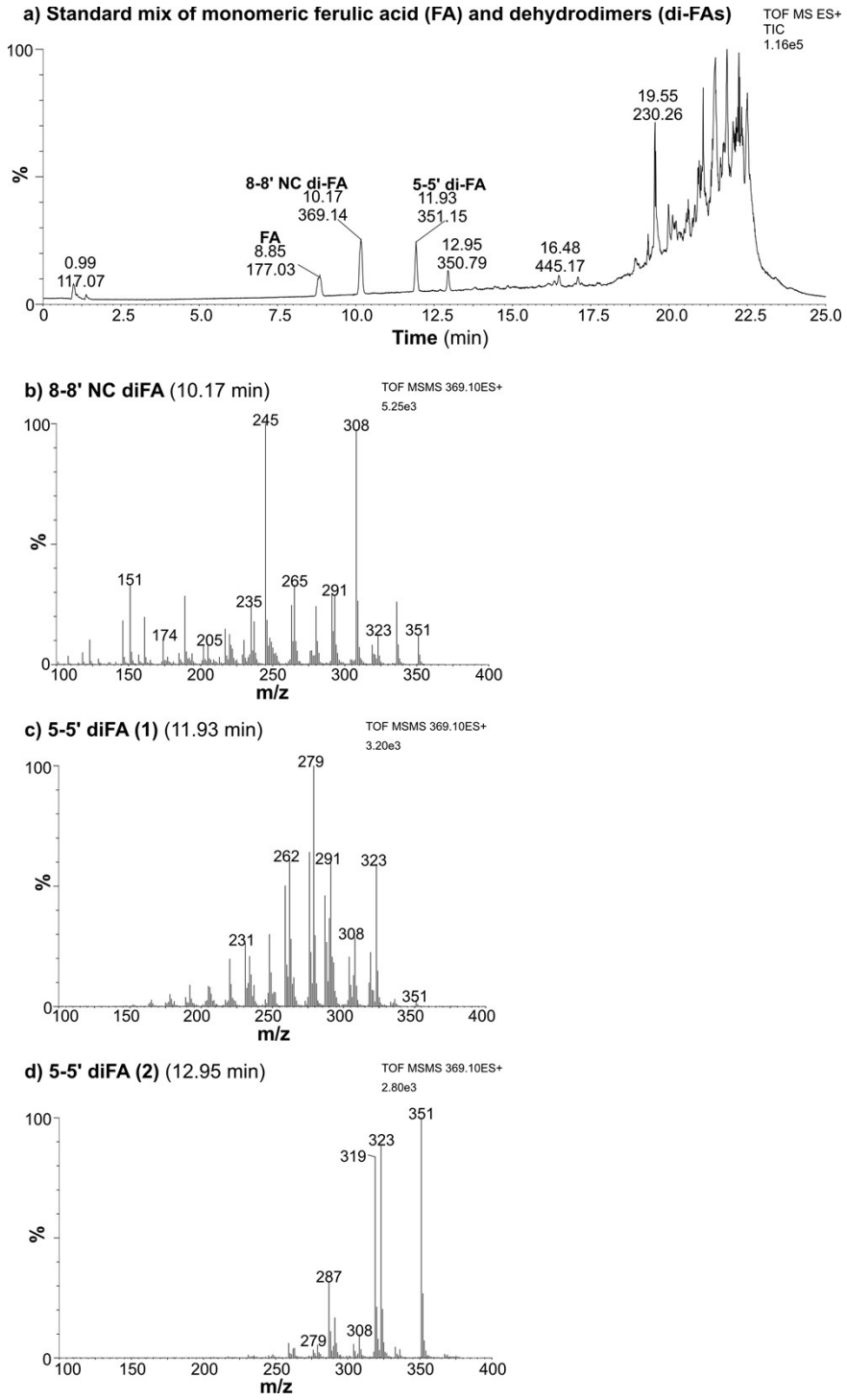


**Figure S2.** a) Ion extracted HPLC-ESI-MS chromatogram of ferulic acid standard mixture containing monomeric FA, 8-8' NC di-FA and 5-5' di-FA. CID-$MS^2$ spectra of (b) 8-8' NC di-FA standard, (c) 5-5' di-FA and (d) 5-5' di-FA isomer eluting at 12.95 min. Assignment of isomer-specific fragments was implemented according to [3].

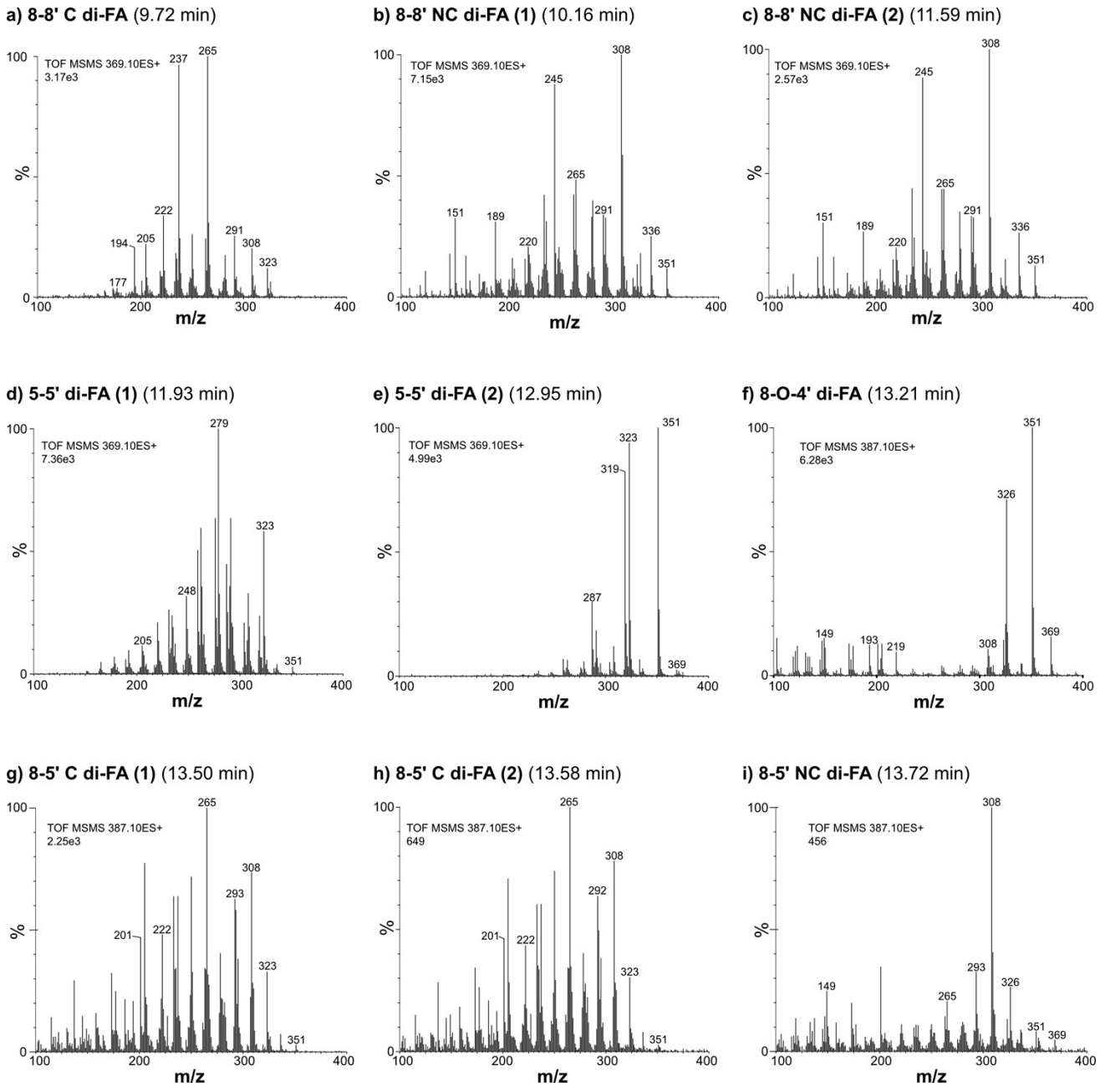


**Figure S3.** CID-MS$^2$ spectra of ferulic acid dehydrodimers (di-FAs) from native (CAX) and crosslinked (CAX-L and CAX-H) corn bran glucuronoarabinoxylan. Assignment of isomer-specific fragments was implemented according to [3].

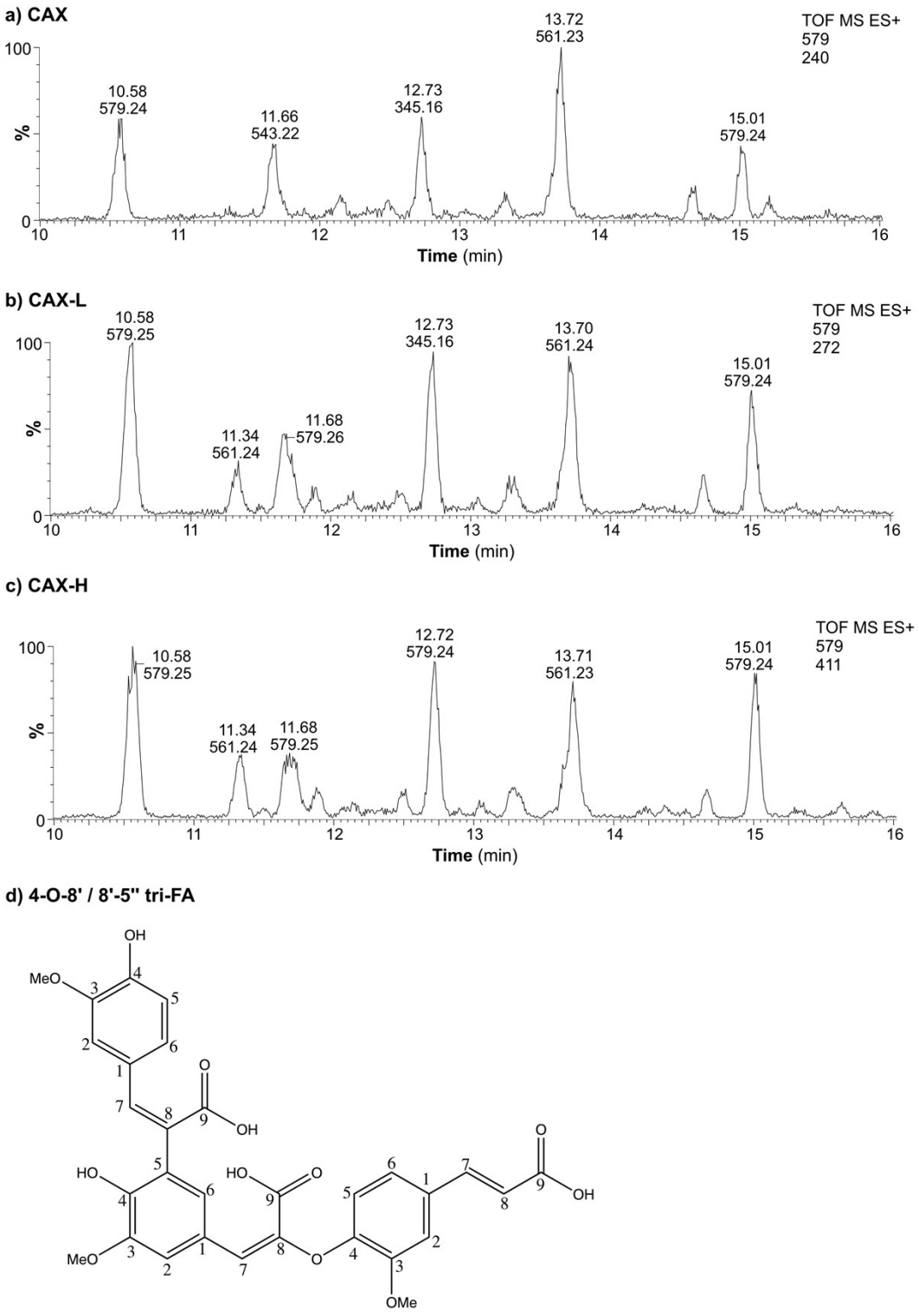


**Figure S4.** Ion extracted HPLC-ESI-MS chromatogram of ferulic acid dehydrotrimers (tri-FAs) in (a) CAX, (b) CAX-L and (c) CAX-H identified by the 579 *m/z* ion, and (d) Chemical structure of a hypothetical tri-FA. Molecular mass of tri-FAs was determined according to [4].

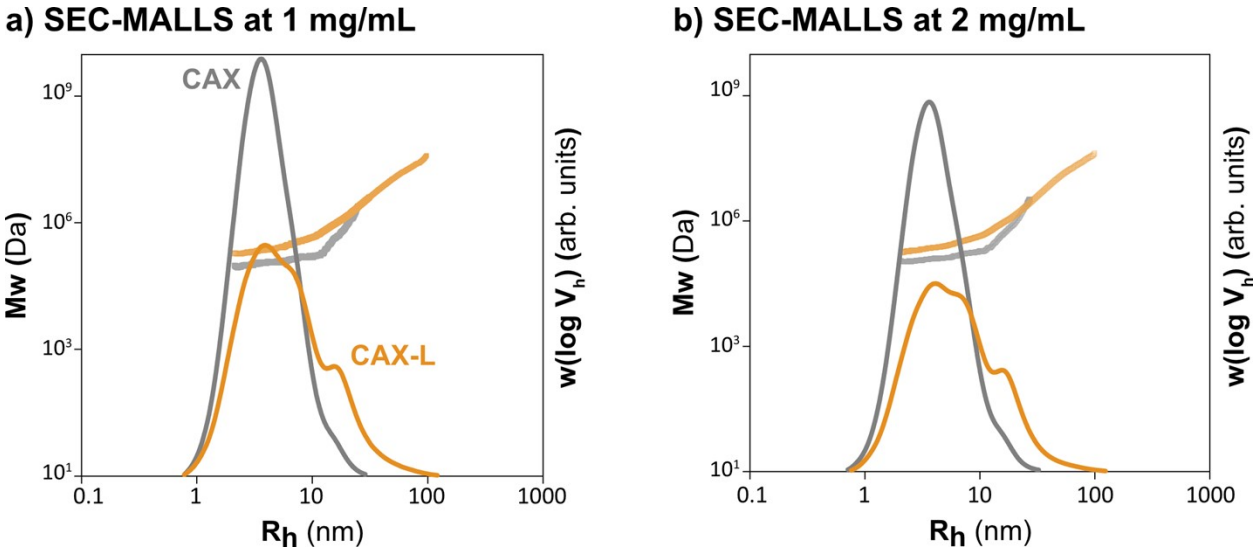


**Figure S5.** Molar mass distributions of CAX and CAX-L prepared at (a) 1 mg/mL and (b) 2 mg/mL

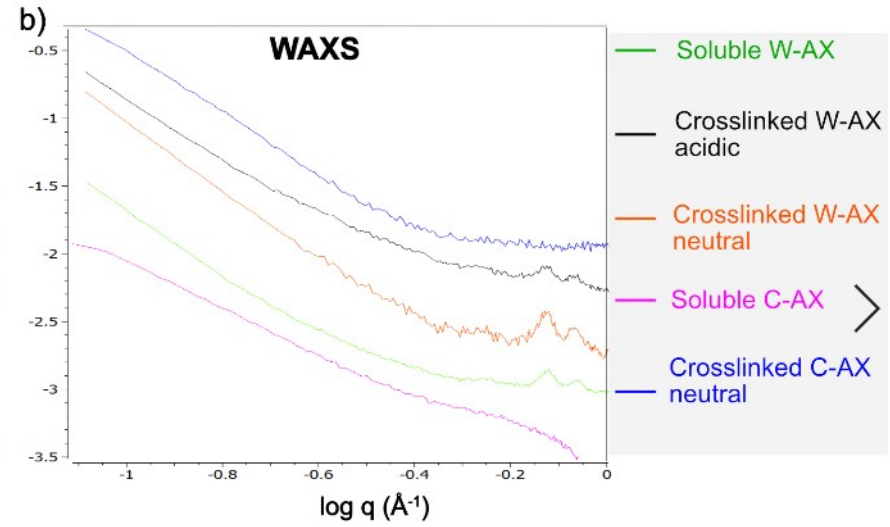


**Figure S6.** Wide-angle X-ray scattering profiles of soluble and crosslinked corn C-AX that reveal the absence of order (crystallinity) compared to similar soluble and crosslinked wheat W-AX (presented in our previous publication Yilmaz-Turan et al[5]).

**References**


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