

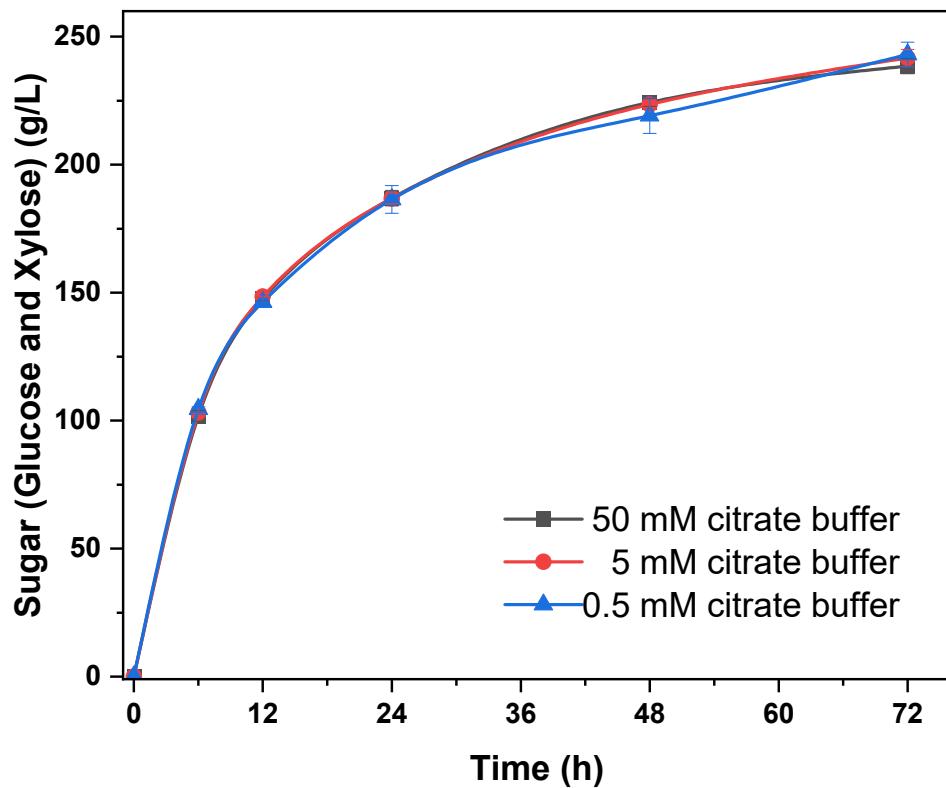
## Supporting information

### Tables

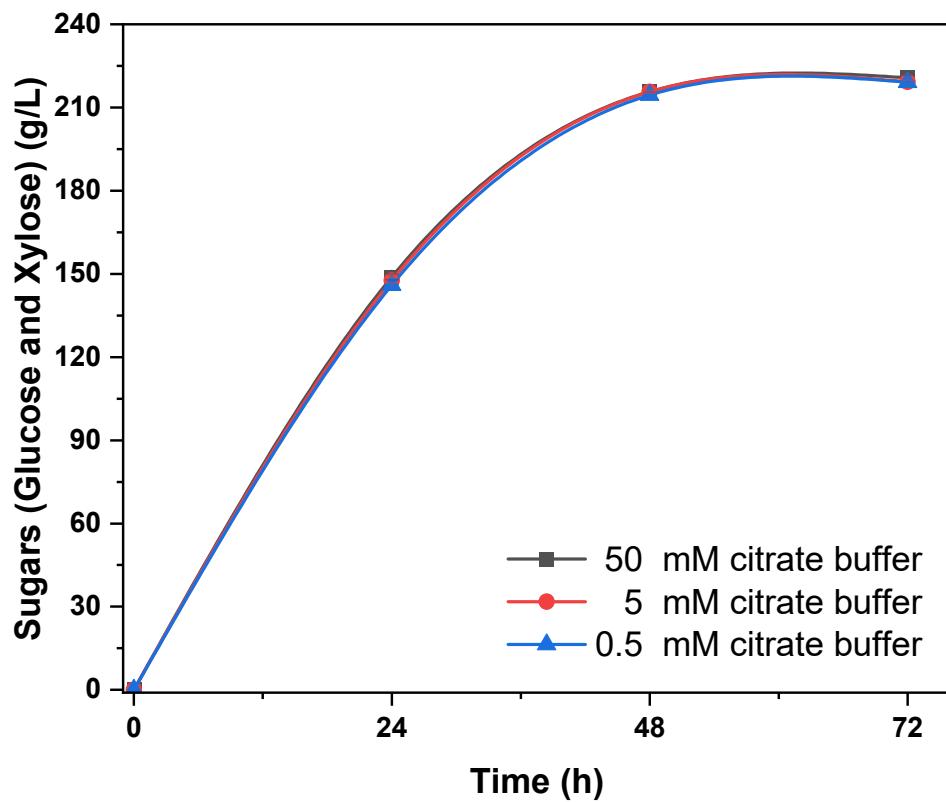
**Table S1** ANOVA results for comparing the enzymatic hydrolysis results from three citrate buffers (50, 5, 0.5 mM)

Solid loading (% w/v)	Time (h)	Number of samples	Mean	Standard deviation	p- Value
20	6	3	103.17	1.3	0.00588
30	12	3	147.46	1.06	0.00123
40	24	3	186.7	0.27	0.00044
50	48	3	222.3	2.8	0.00021
60	72	3	241.08	2.3	0.00014

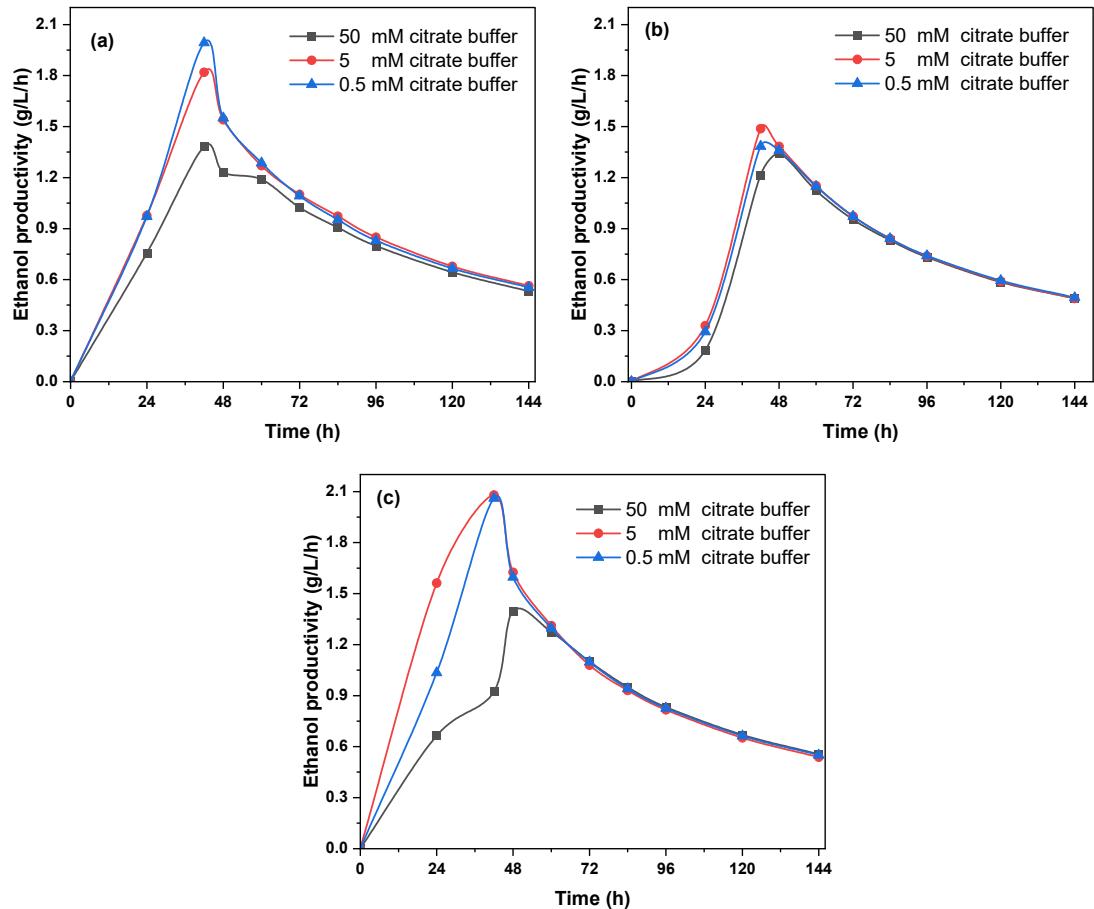
## Figures



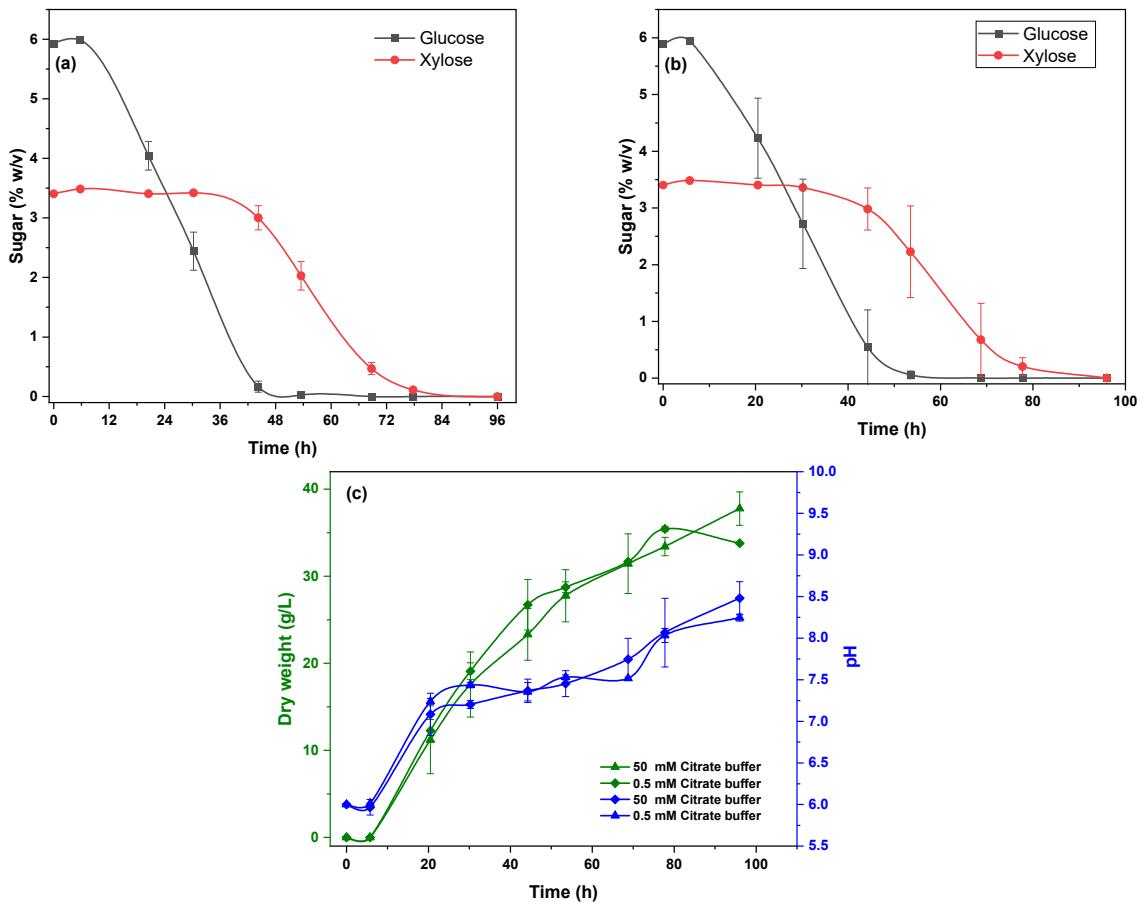
**Figure S1** Sugar (glucose plus xylose) yield from enzymatic hydrolysis of hydrothermal pretreated bioenergy sorghum biomass at 20% to 60% (*w/v*) solid loadings in different citrate buffer strengths



**Figure S2** Sugar (glucose plus xylose) yield at 30% to 50% (w/v) solid loadings of enzymatic hydrolysis of hydrothermally pretreated bioenergy sorghum biomass in the scale-up study at different citrate buffer strengths



**Figure S3** Ethanol productivity profile of (a) commercial recombinant *S. cerevisiae* (b) *S. cerevisiae* CT2 Pro and (c) Co-culture (ethanol red and commercial recombinant *S. cerevisiae*) on different hydrolysates 50, 5, and mM citrate buffer



**Figure S4** Glucose and xylose utilization profiles of *R. toruloides* Y-6987 during the fermentation of enzymatic hydrolysates derived from (a) 50 mM citrate buffer strength (b) 0.5 mM citrate buffer strength at 100 g/L sugar concentration and (c) pH and cell dry weight