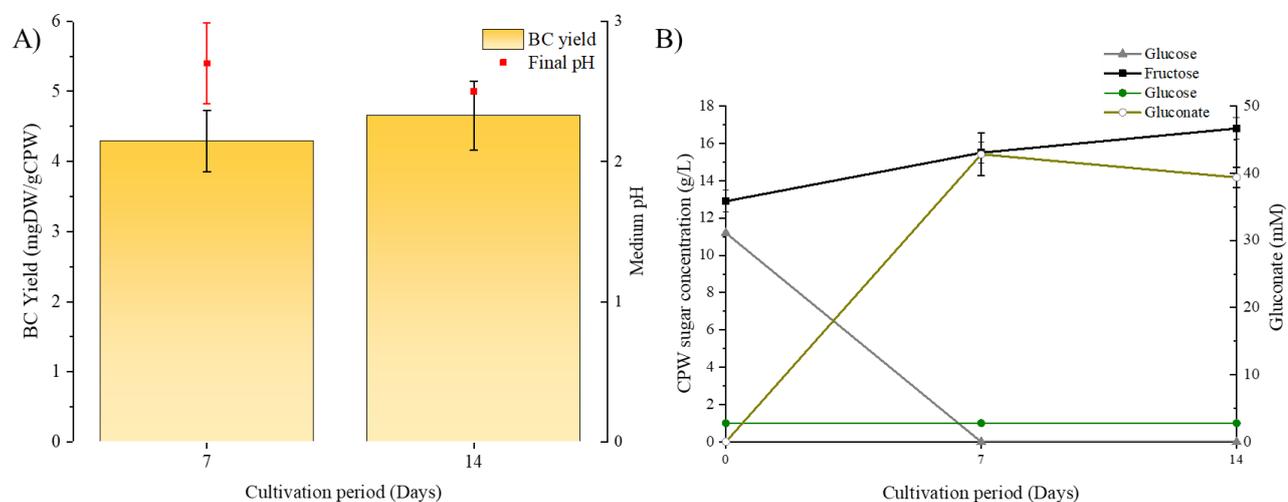


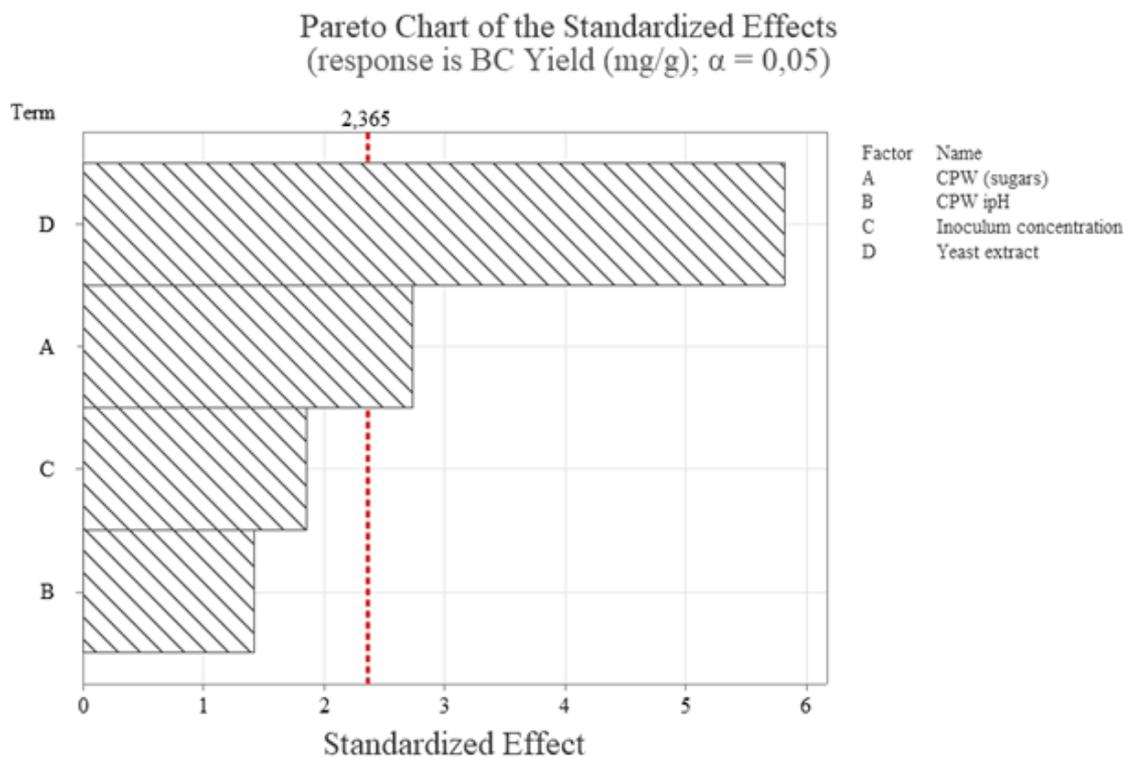
## Supplementary figures



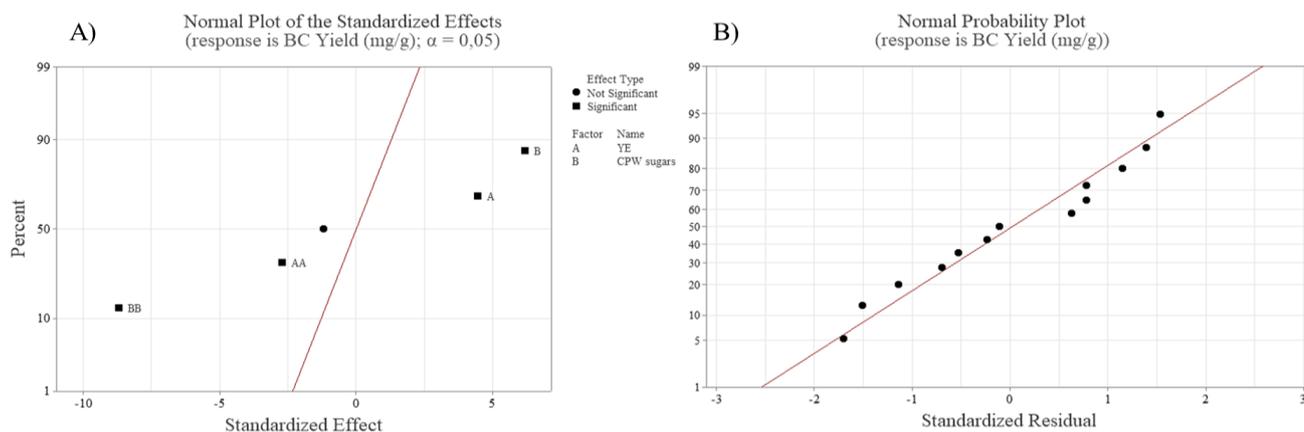
**Figure S1.** Preliminary BC production tests by *K. sucofermentans* on CPW containing 20 g/L sugar total sugar content. A) BC yield (mgBC/gCPW) and final medium pH after 7 and 14 days of cultivation in CPW medium. B) Sugar consumption and gluconic acid production profile of *K. sucofermentans* after 7 and 14 days of cultivation. The averaged values and standard deviations (error bars) from triplicate cultivations are presented. In some cases, the error bars are smaller than the symbols.



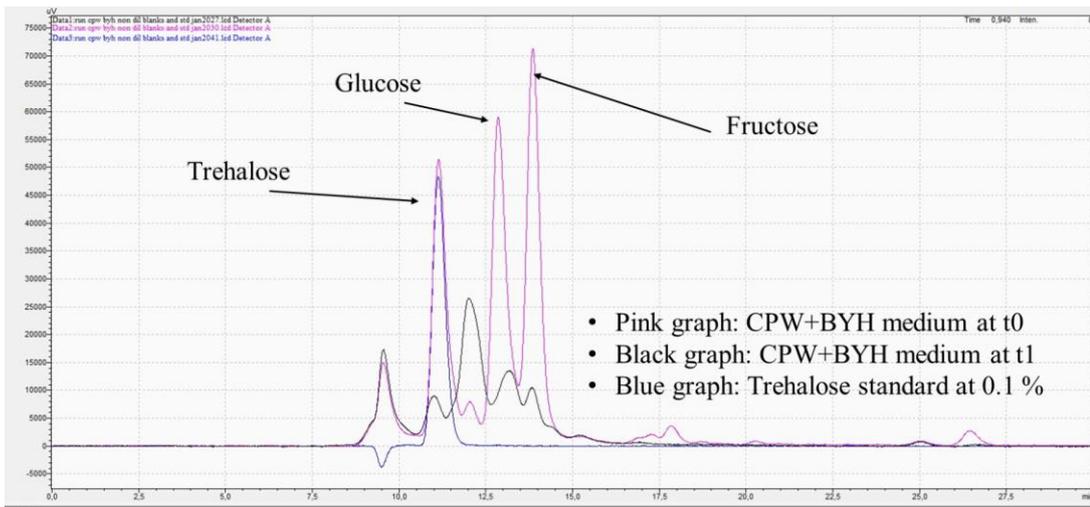
**Figure S2.** pH dependent colour changes in CPW solution with a 20 g/L sugar concentration. The pH was adjusted adding 5M NaOH and the colour change highlights the presence of flavonoids (anthocyanins) in the solution.



**Figure S3.** Pareto chart of the standardised effect for the Plackett-Burman design factors (A, CPW sugars; B, ipH; C, inoculum concentration; D, YE) on BC yield, showing the statistical significance of CPW sugars and yeast extract.



**Figure S4.** Response surface regression analysis of central composite design (CCD). A) Normal plot of the standardised effects showing the statistical significance of factor A (yeast extract (YE)), factor B (CPW sugars) and their quadratic effects on BC yield (g/g), chosen as model response; B) Normal probability plot showing that the internally studentized residuals closely follow a straight line, suggesting that the residuals are approximately normally distributed.



**Figure S5.** HPLC elution graphs of the CPW-BYH-based medium before (pink graph, t0) and after (black graph, t1) *K. sacrofermentans* cultivation. The blue graph representing the trehalose standard highlights its presence in the CPW-BYH-based medium. Due to the overlapping of trehalose and sucrose peaks, it is not possible to quantify their concentration precisely.