

## Supplementary data

Table S1 Amount of electrolyte solution

Electrolyte	SSF (mM)	SGF (mM)	SIF (mM)
KCl	30.2	13.8	13.6
KH <sub>2</sub> PO <sub>4</sub>	7.4	1.8	1.6
NaHCO <sub>3</sub>	27.2	50	170
NaCl	-	94.4	76.8
MgCl <sub>2</sub> ·6H <sub>2</sub> O	0.3	0.24	0.66
(NH <sub>4</sub> ) <sub>2</sub> CO <sub>3</sub>	0.12	1.0	-
HCl	2.2	31.2	16.8
CaCl <sub>2</sub> ·2H <sub>2</sub> O	3.0	0.3	1.2

SSF: Simulated salivary fluid; SGF: simulated gastric fluid; SIF: simulated intestinal fluid.

Table S2 The chemical compositions of CCPs.

Total carbohydrate content (%)	Uronic acid content (%)	Protein content (%)
95.54±0.26b	6.35±0.51a	3.93±0.99a

Table S3 Basic sequencing indexes and Alpha diversity of samples from different treatment groups

Sample	Seq num	OUT num	Shannon index	ACE index	Chao1 index	Coverage	Simpson
BLK	59116±22567a	390±144b	2.315±1.134b	782±142a	622±147a	0.997±0.0014a	0.304±0.3165ab
CCPs	51102±17046a	300±71ab	2.271±0.336b	778±176a	514±101a	0.997±0.0005a	0.176±0.0777a
INL	48364±10560a	231±26a	1.314±0.158a	800±166a	538±63a	0.998±0.0002a	0.598±0.0535b
OR	67301±5226a	359±16ab	2.402±0.075b	718±26a	547±28a	0.998±0.0002a	0.208±0.0081a

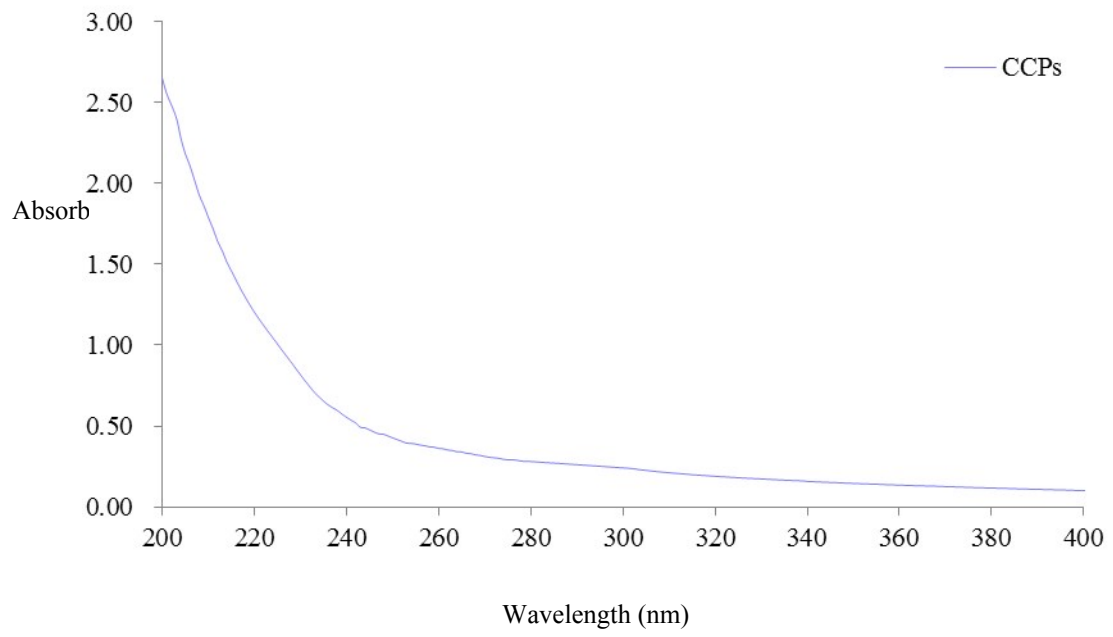


Figure S1 UV spectrum scanning of CCPs.

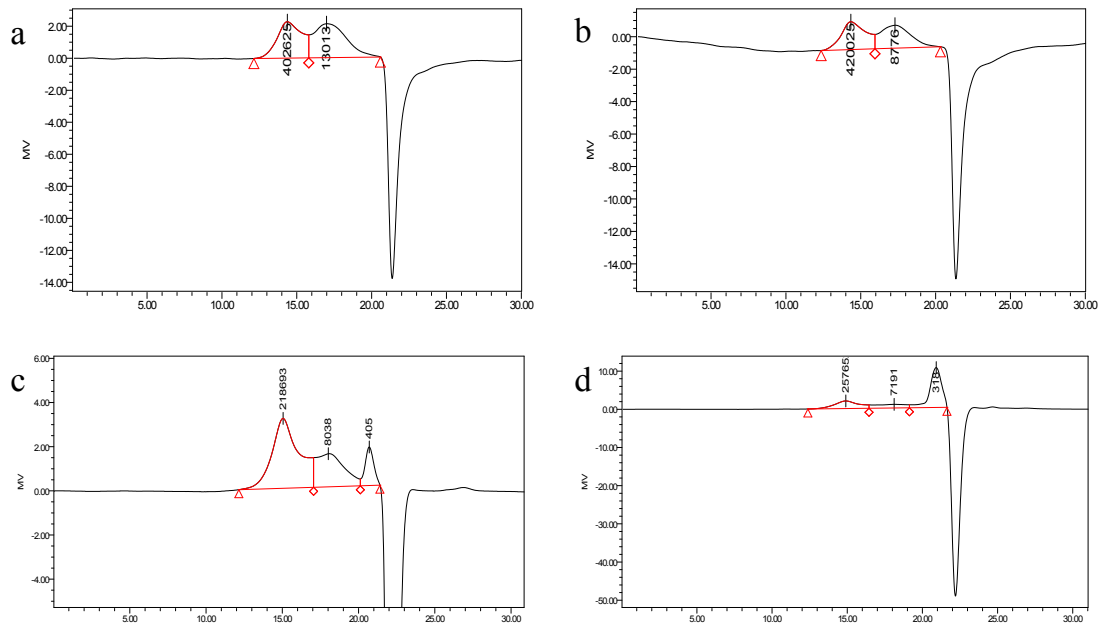


Figure S2 High performance gel permeation chromatograms exhibiting the changes in the Mw of CCPs during digestion. (a) CCPs, polysaccharides from *C. cornucopioides*; (b) CCPs-S, Saliva digestion; (c) CCPs-G, Gastric digestion; (d) CCPs-I, intestinal digestion.

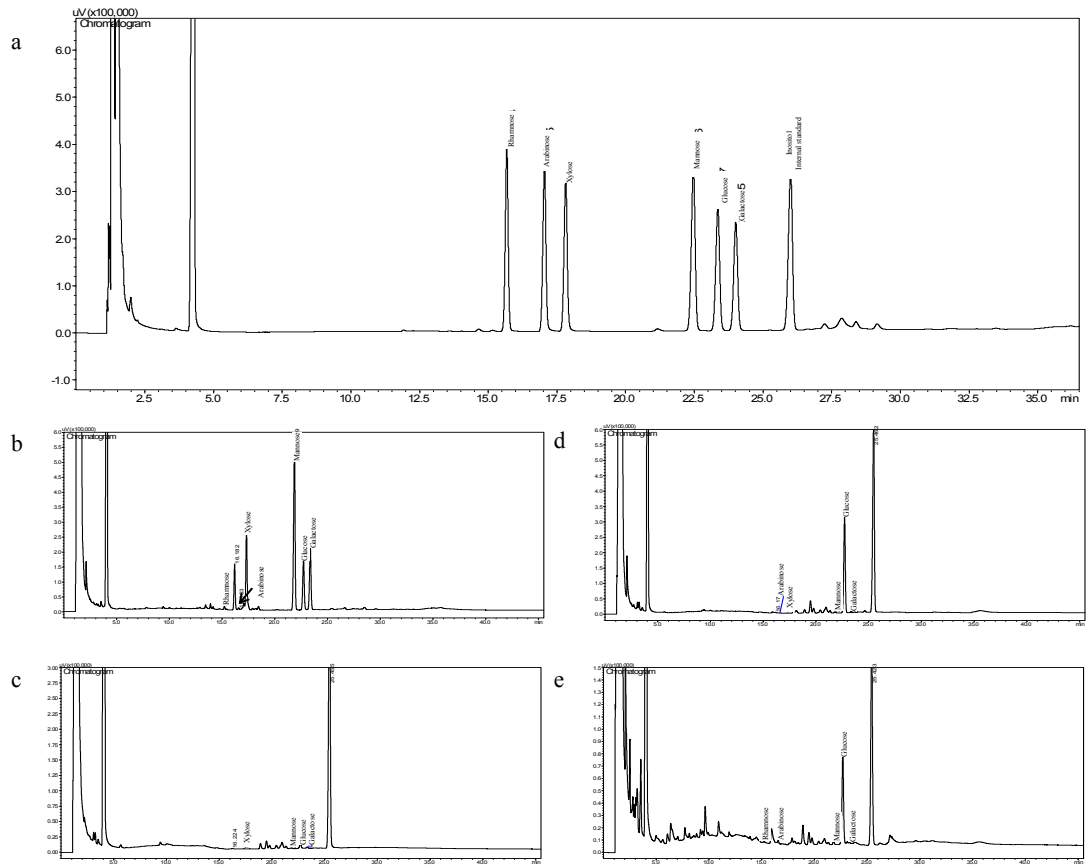


Figure S3 Gas chromatograms exhibiting the monosaccharide compositions of CCPs during digestion. (a) standard sample; (b) CCPs, polysaccharides from *C. cornucopeoides*; (c) CCPs-S, Saliva digestion; (d) CCPs-G, Gastric digestion; (e) CCPs-I, intestinal digestion.

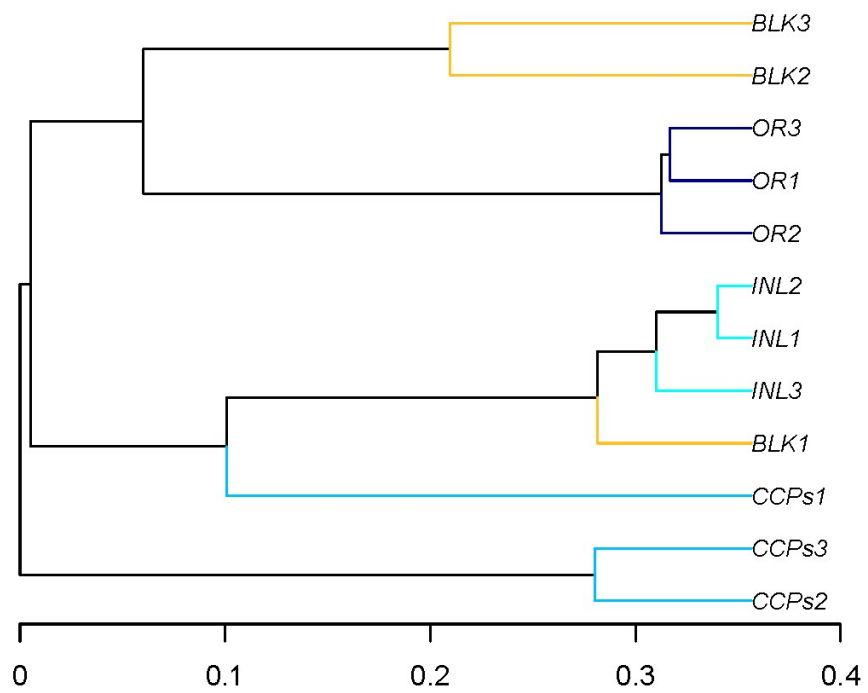


Figure S4 OTU-based sample clustering tree. OR, group of original feces; BLK, group of fermentation *in vitro* without carbon source; INL, group of fermentation *in vitro* with addition of inulin; CCPs, group of fermentation *in vitro* with addition of CCPs.

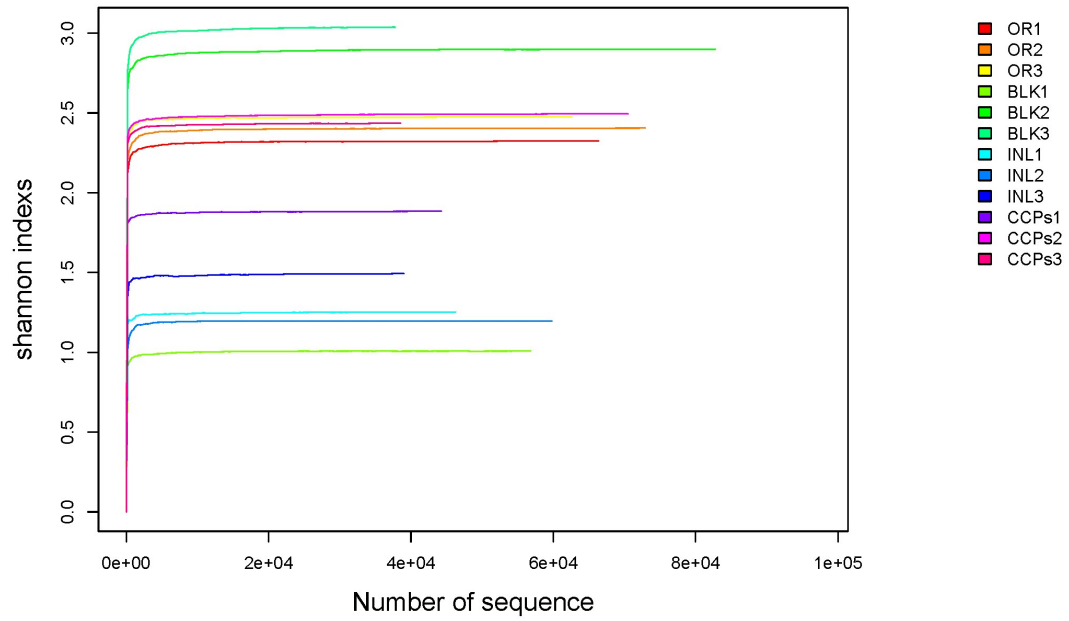


Figure S5 Alpha index rarefaction curve. OR, group of original feces; BLK, group of fermentation *in vitro* without carbon source; INL, group of fermentation *in vitro* with addition of inulin; CCPs, group of fermentation *in vitro* with addition of CCPs.



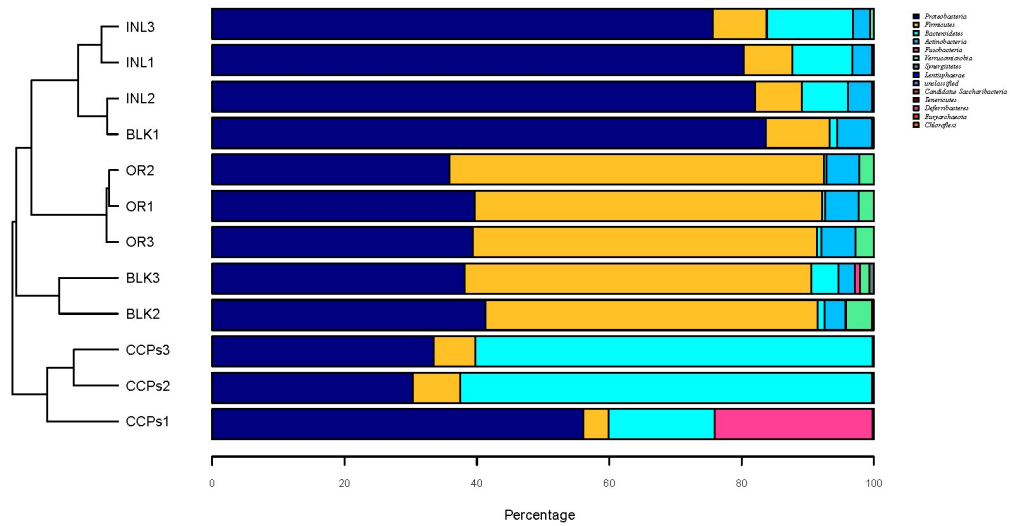


Figure S6 Phylum cluster barplot. OR, group of original feces; BLK, group of fermentation *in vitro* without carbon source; INL, group of fermentation *in vitro* with addition of inulin; CCPs, group of fermentation *in vitro* with addition of CCPs.

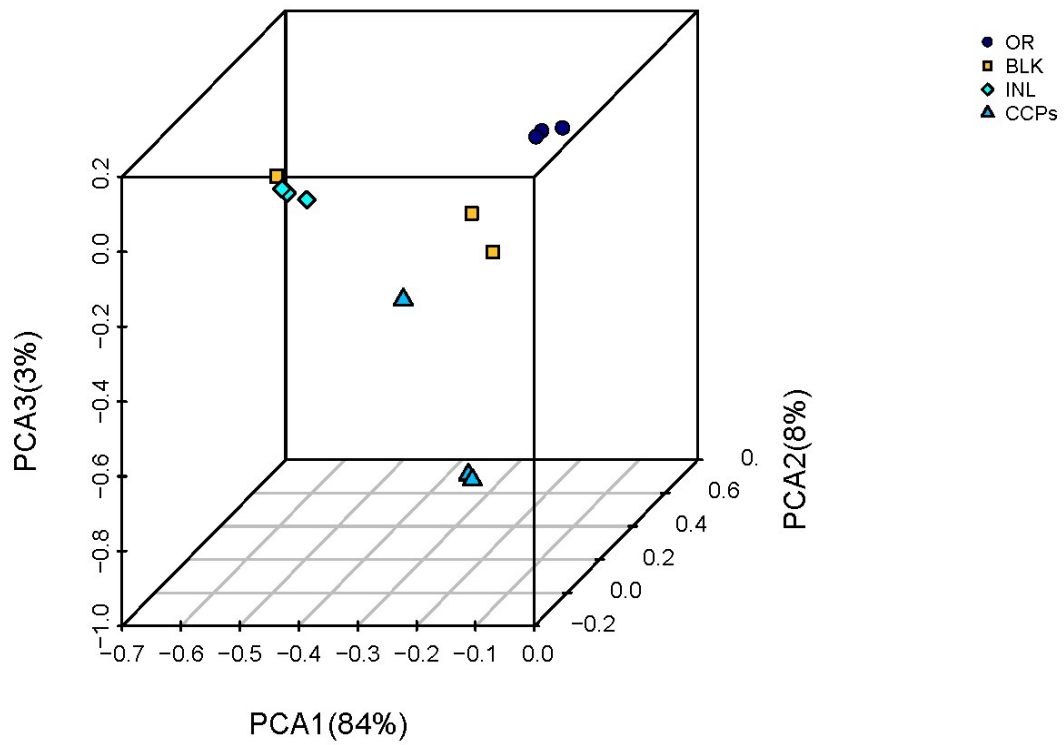


Figure S7 OTU-based 3D PCA diagram. OR, group of original feces; BLK, group of fermentation *in vitro* without carbon source; INL, group of fermentation *in vitro* with addition of inulin; CCPs, group of fermentation *in vitro* with addition of CCPs.

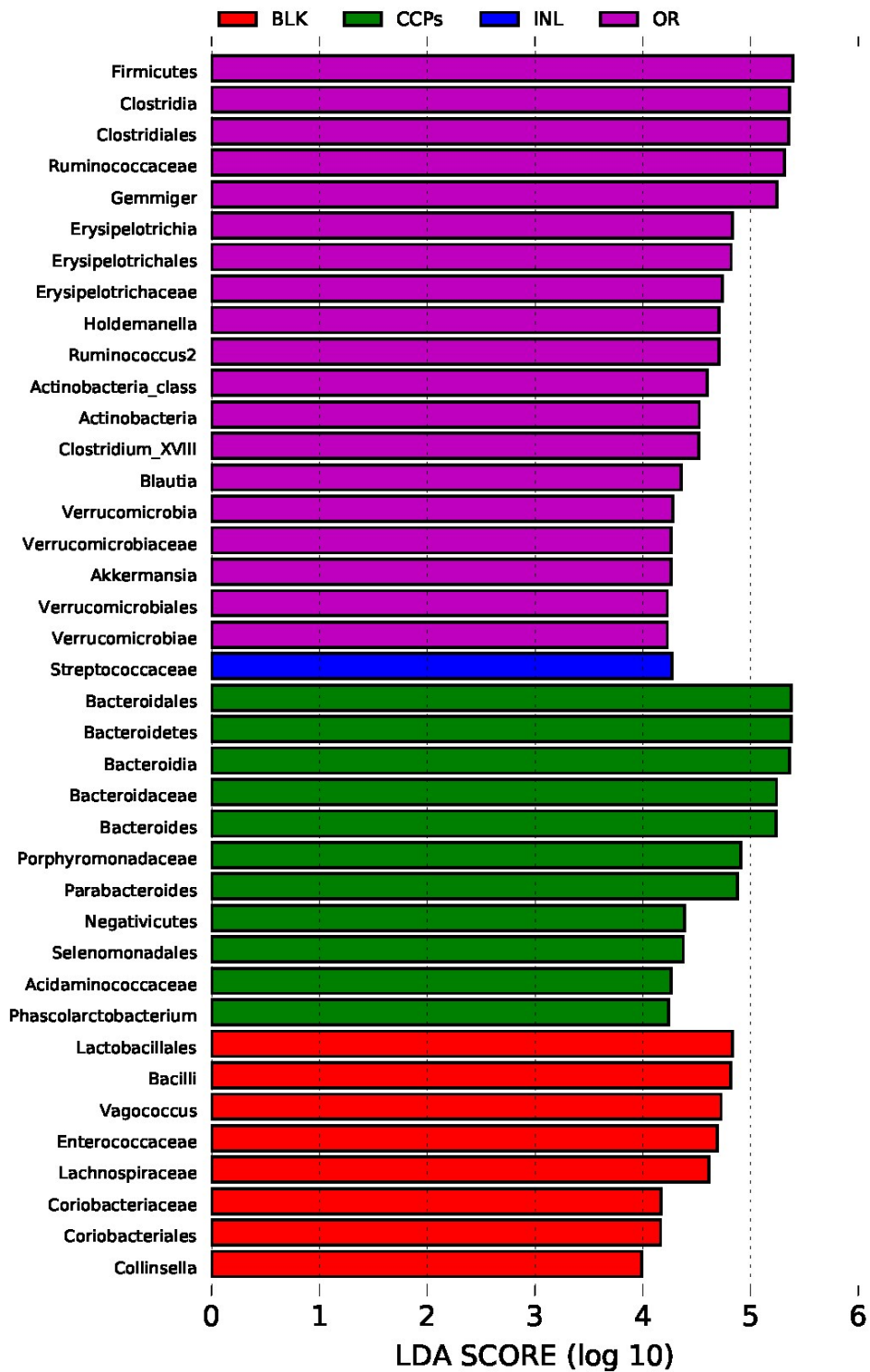


Figure S8 LEfSe analysis histogram. OR, group of original feces; BLK, group of fermentation *in vitro* without carbon source; INL, group of fermentation *in vitro* with addition of inulin; CCPs, group of fermentation *in vitro* with addition of CCPs.