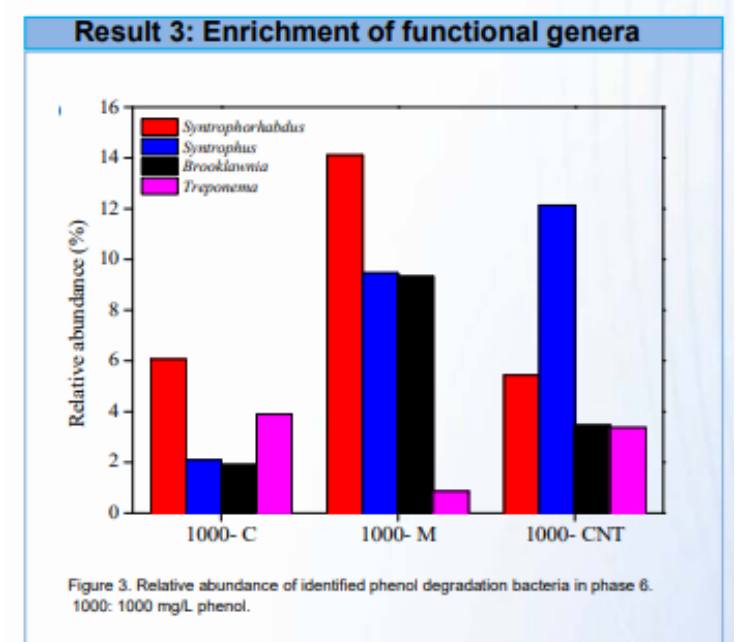
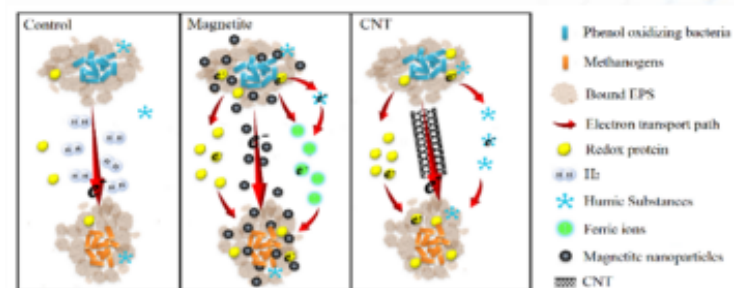
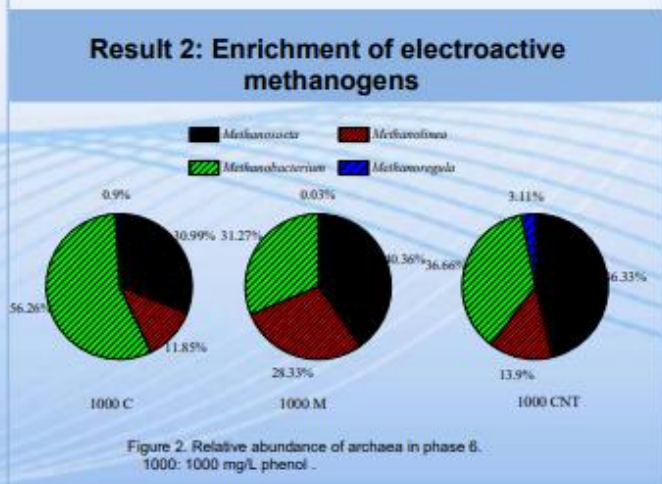
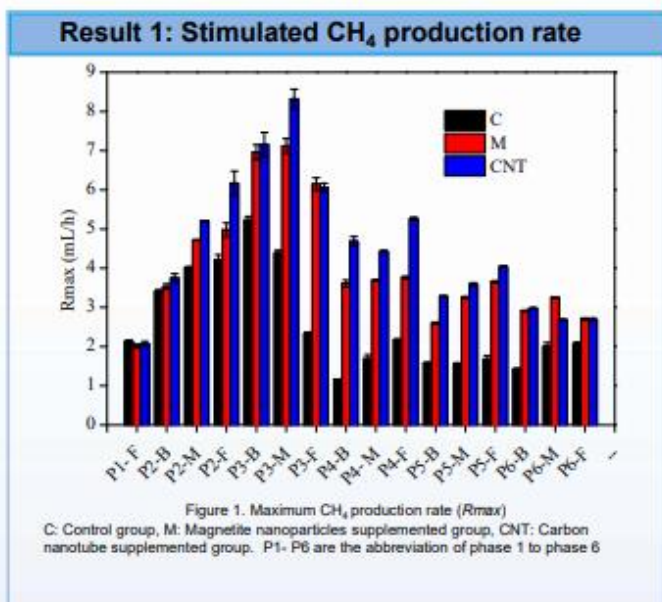
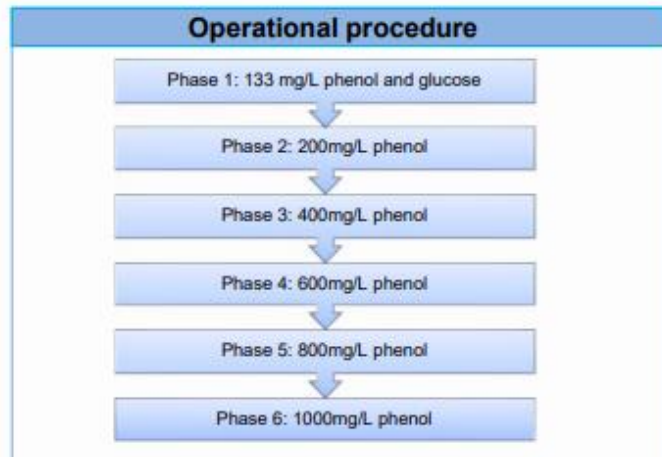


ENHANCED ANAEROBIC DEGRADATION BY CONDUCTIVE MATERIALS

Abstract

Anaerobic digestion is often constrained by the presence of toxic compounds and limited methanogenic activity, which reduce process efficiency. This project developed a strategy to enhance anaerobic degradation by incorporating conductive materials (CMs), which facilitate direct interspecies electron transfer and accelerate syntrophic methanogenesis. The addition of CMs was found to act as an electron conduit, modify the composition of extracellular polymeric substances (EPS), and promote the growth of functional microbial genera, collectively improving process stability, mitigating toxicity, and enhancing overall degradation performance.



Result 4: Role of EPS in electrons shuttle

Table 1. Quantification of sub-fractions (mg-C/L) of observed organic compounds in EPS.

Sample	High molecular weight protein	Low molecular weight protein	Humic substances	Building blocks
SB-C	7.54	12.27	8.12	4.89
SB-M	4.67	234.82	4.94	3.65
SB-CNT	6.92	105.77	25.20	22.66
LB-C	1.27	7.12	1.10	1.16
LB-M	1.92	24.91	3.02	4.52
LB- CNT	1.64	18.85	1.39	2.19
TB-C	1.45	13.95	0.63	2.52
TB-M	2.41	24.25	1.71	3.56
TB- CNT	0.16	29.25	0.24	0.53



PI Prof Yan Zhou