Optimization of bacterial biorefinery for sustainable biodiesel production and flue gas reduction: A holistic approach to climate change mitigation and circular economy

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Supplementary

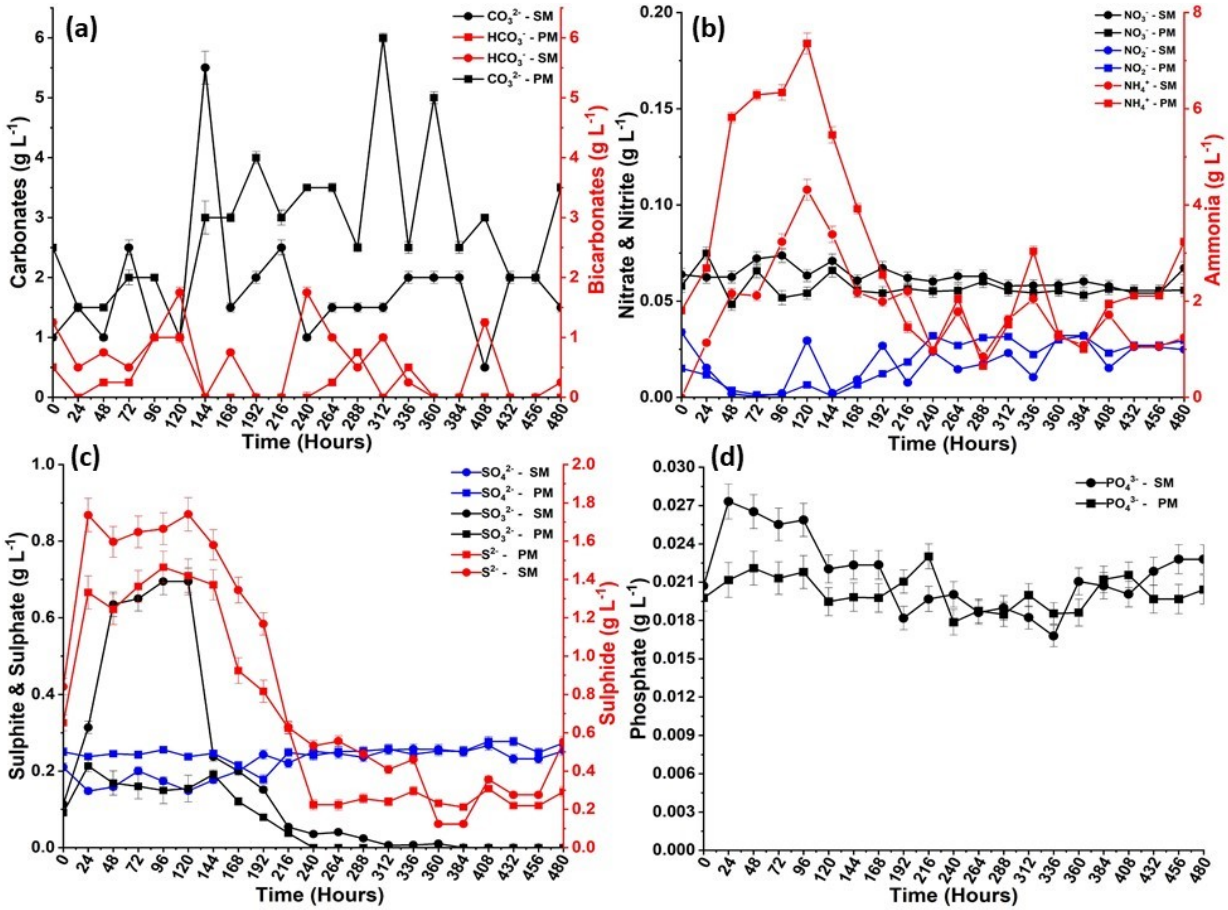

Fig. S1. Nutrient concentration in the media due to dissolved CO_2 **(a)** CO_3^{2-} and HCO^{3-}; NO **(b)** NH_4^+, NO_2^- and NO_3^-; SO_2 **(c)** SO_4^{2-}, SO_3^{2-} and S^{2-}; **(d)** PO_4^{3-}

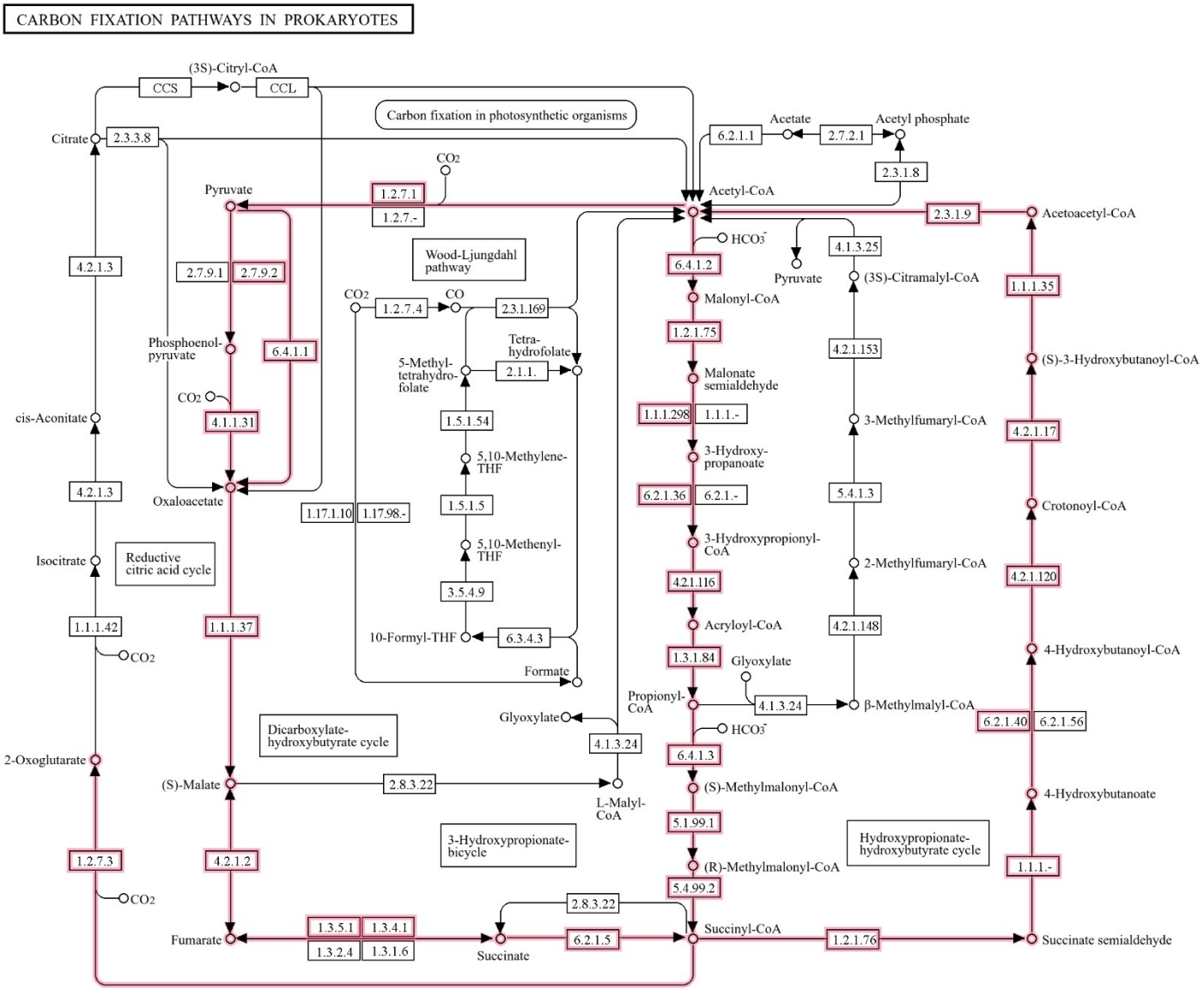

Fig. S2. The carbon fixation pathways followed by the bacteria for the CO_2 metabolism.

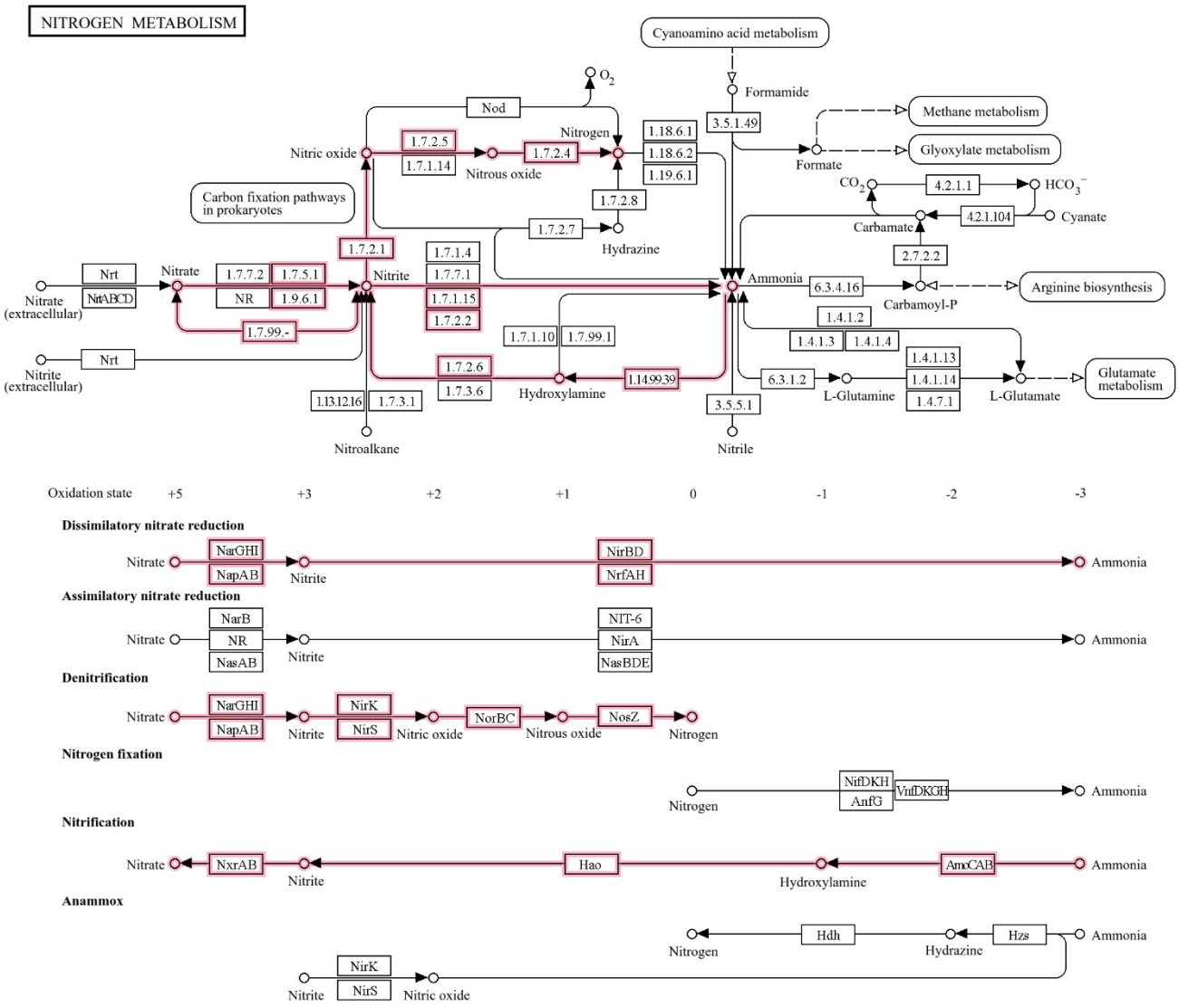

Fig. S3. The nitrogen fixation pathways followed by the bacteria for the NOx metabolism.

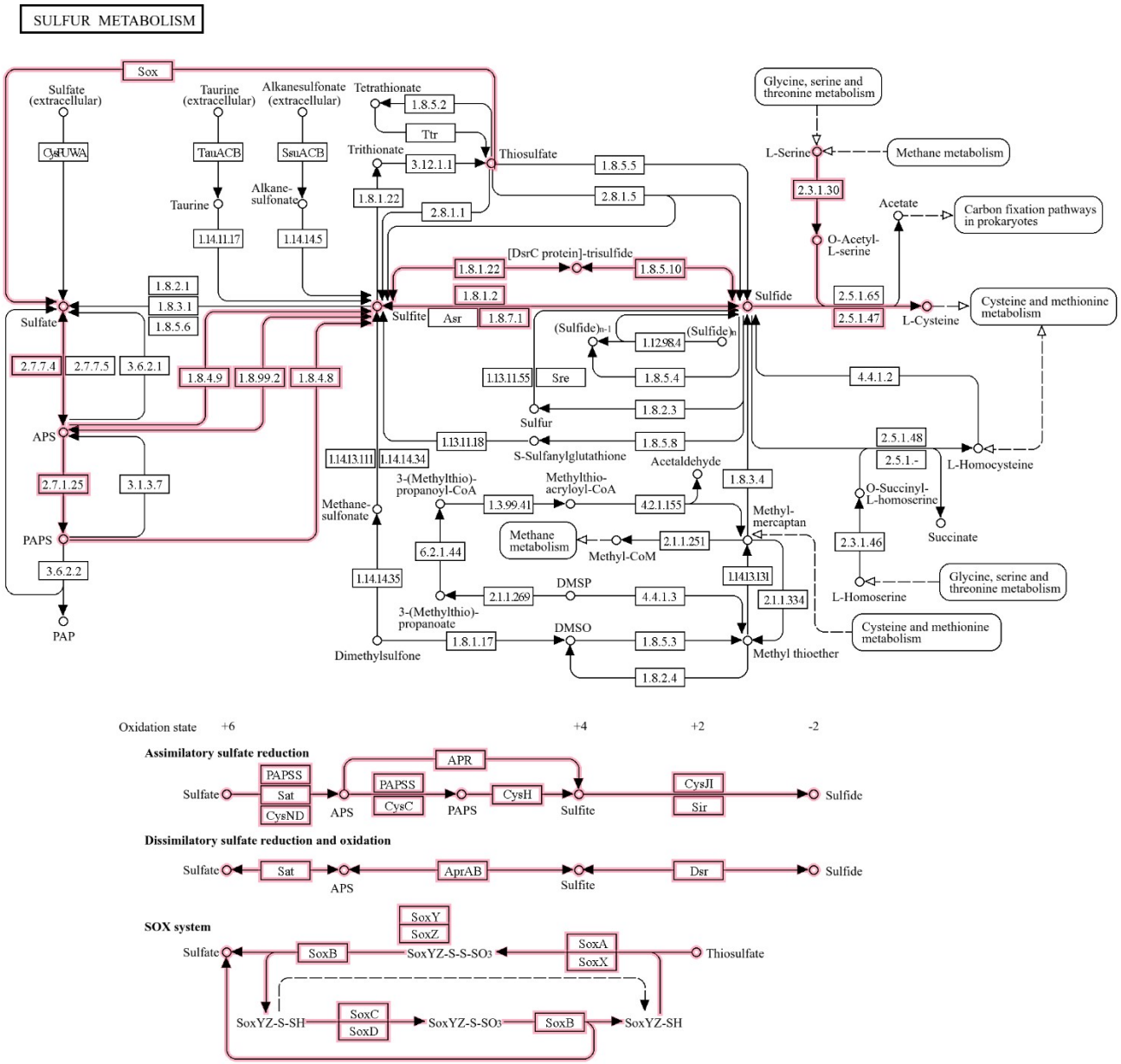

Fig. S4. The sulfur fixation pathways followed by the bacteria for the SOx metabolism

Table S1. Cost breakdown of the working capital for the techno-economic assessment.

Working capital expenditure	Commodity	Cost (US$)
MSM (cost per gram)	Nutrient broth	0.018
	Potassium Nitrate	0.0018
	Dipotassium hydrogen phosphate	0.0018
	Ammonium Chloride	0.059
	Sodium Thiosulphate	0.00057
	Sodium Chloride	0.0000061
Packing material	PU foam sheet	3.25
Energy consumption @	Air compressor (8 units/day)	8.45

0.096 US$ /unit electricity	Pump (3 units/day)	3.17
	Reactor central unit (4.5 units/day)	4.77
	Flue gas analyzer (2 units/day)	2.11
Workforce (per day)	Labor charges	2.17