

Table S1. Primers used for PCR and qPCR in this study.

Primer name	Sequence of primer (5' to 3') ^a
Primers for PCR	
<i>pgdS</i> -AF(<i>Xba</i> I)	GCTCTAGAAAAGGAACAAACCTCGACTGGA
<i>pgdS</i> -AR	<u>CGAACGATCTGTCAATGTTTTGCGGTTCCCATCCCGAATTG</u>
<i>pgdS</i> -BF	<u>CAATTCGGGATGGGAACCGCAAAACATTGACAGATCGTTCG</u>
<i>pgdS</i> -BR(<i>Sac</i> I)	CGAGCTCCGGGGGAACGGTCCACGA
<i>pgdS</i> -YF	TTTCTACAGCCTCGGCAACT
<i>pgdS</i> -YR	CGGCAAACCTGCTCTTACA
T2-F	ATGTGATAACTCGGCGTA
T2-R	GCAAGCAGCAGATTACGC
Primers for qPCR	
16s rRNA-F	ACCTAACCAGAAAGCCACGG
16s rRNA-R	GTTTACGGCGTGGACTACCA
<i>ndh</i> -F	TGTCGTCGGTCTTGGTTCTG
<i>ndh</i> -R	ATGAAGTCTGGCTGCTGACC
<i>cydB</i> -F	AGTCGTATTCGCCGTTTTGG
<i>cydB</i> -R	GCTGCCGAAAAATACGACCC
<i>qoxB</i> -F	CCGCCGCACTATAACTTTGC
<i>qoxB</i> -R	CACCGATCAGACCGACGATT
<i>fnr</i> -F	TGACGTCCGATGGCAAAGAA
<i>fnr</i> -R	AAACTCAAACGTCAGCGCAC
<i>narG</i> -F	ATTGCCAAATACGGCCCTGA
<i>narG</i> -R	TAGCGGGCTTCGGCTAAAAA
<i>nasB</i> -F	ACGAATGCCGAAGAGCTGAA
<i>nasB</i> -R	GAAGCGTACACGCAATCGTC
<i>nasD</i> -F	GAGCGACGATGAGATCGTGT
<i>nasD</i> -R	TCAAATTCTGAGCCGAGCGT

^a The underlines indicate an overlap region for splicing overlap extension PCR (SOE- PCR); Generated restriction site in bold.

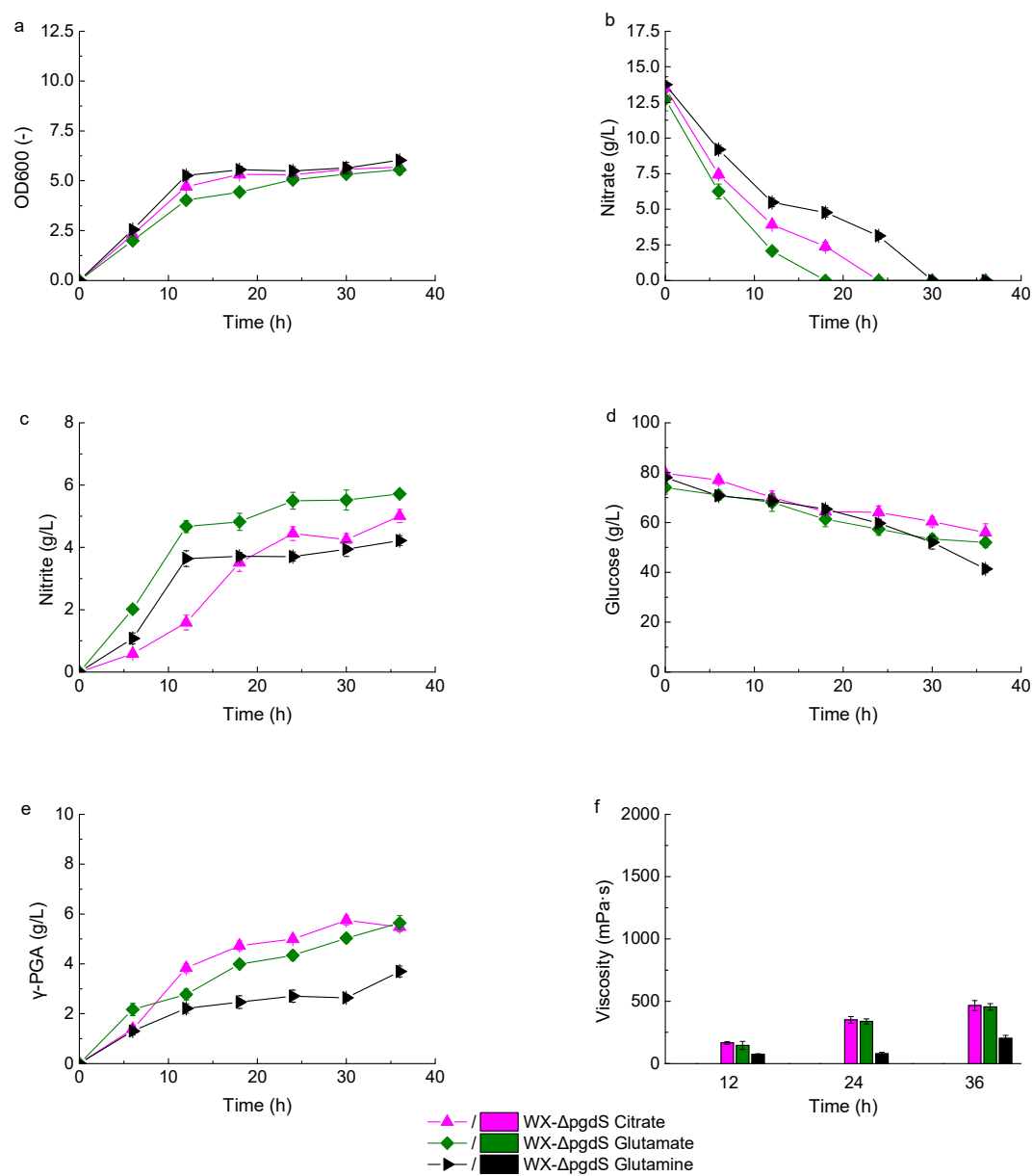


Figure S1. The fermentation profiles of WX- Δ pgdS with using different precursor substrates under the regular oxygen supply conditions. (a) OD600; (b) Nitrate; (c) Nitrite; (d) Glucose; (e) γ -PGA yield; (f) Broth viscosity.

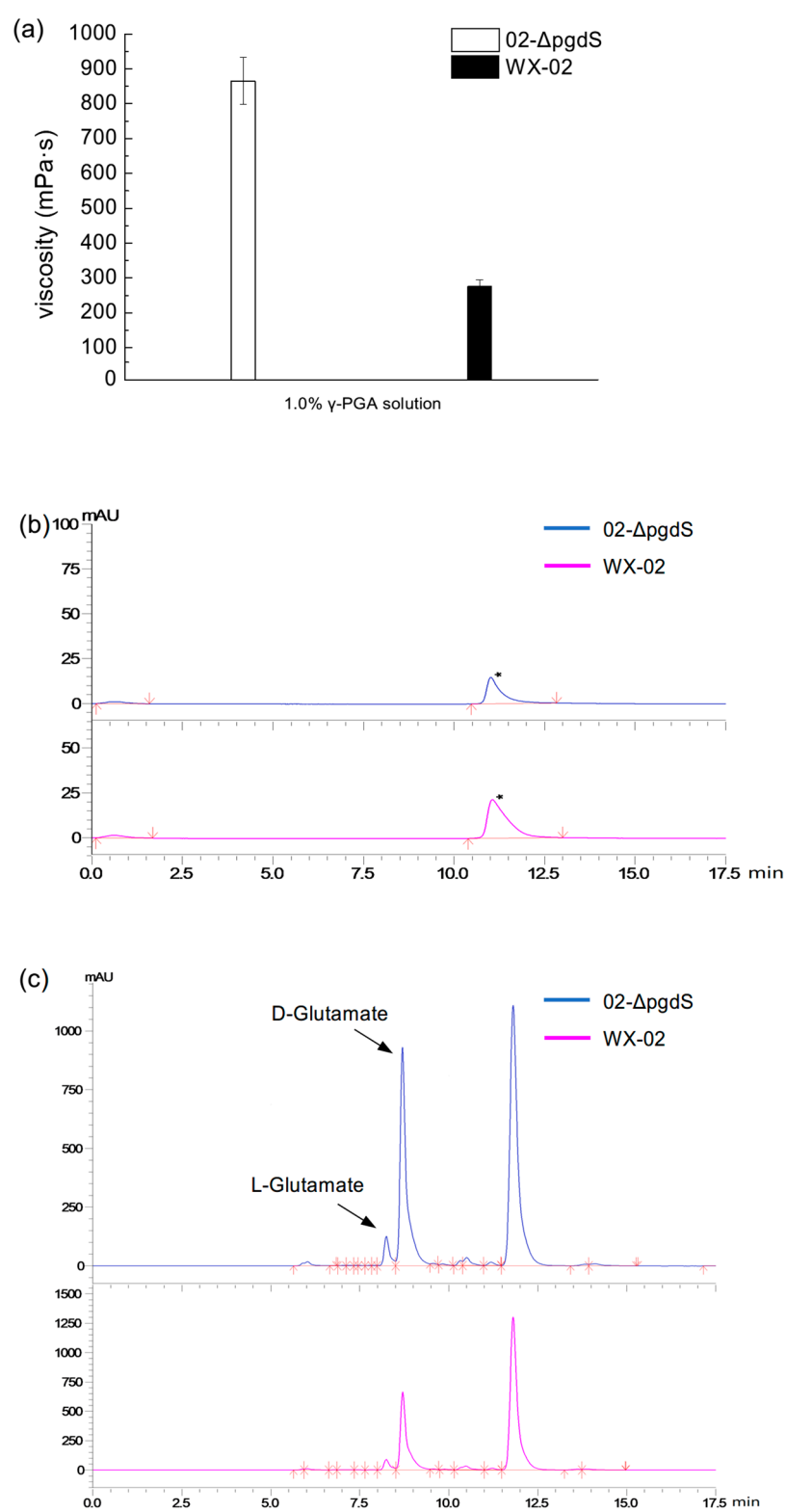


Figure S2. Characteristics assay of γ -PGA produced by WX- Δ pgdS and WX-02. (a) viscosity of 1.0% γ -PGA solution; (b) GPC profile of γ -PGA; (c) The concentration of D/L-glutamate in hydrolyzed γ -PGA.

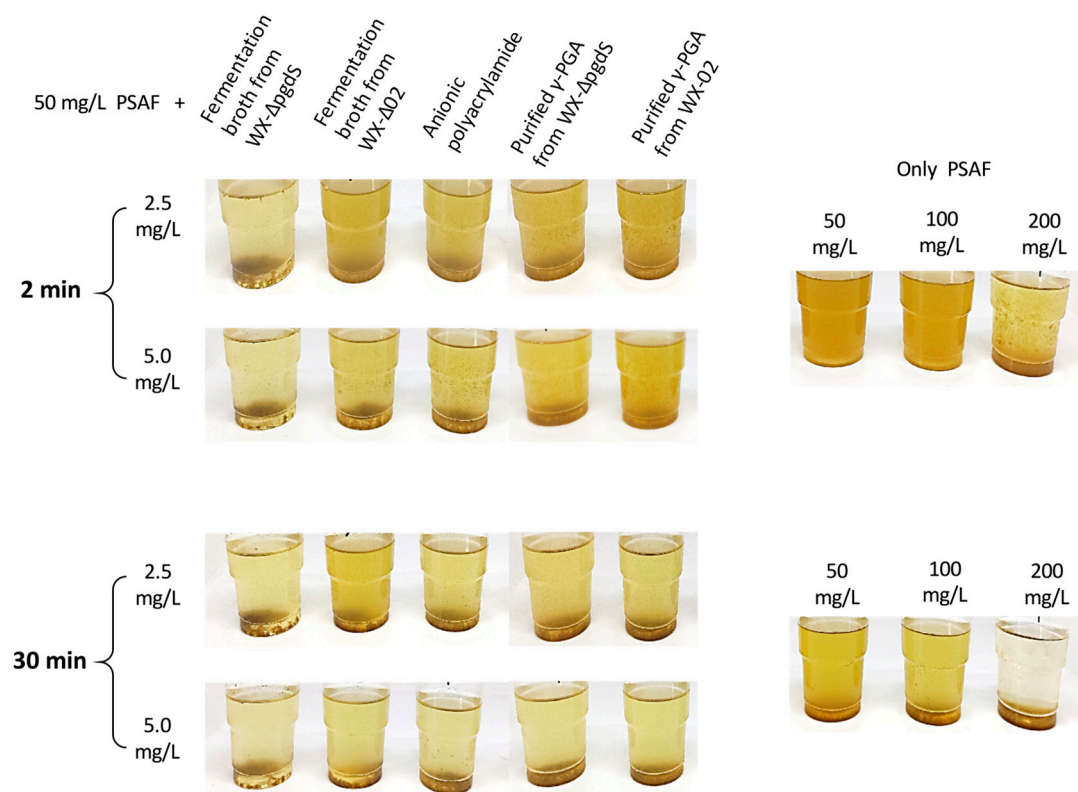


Figure S3. Flocculation of microalgae suspension.