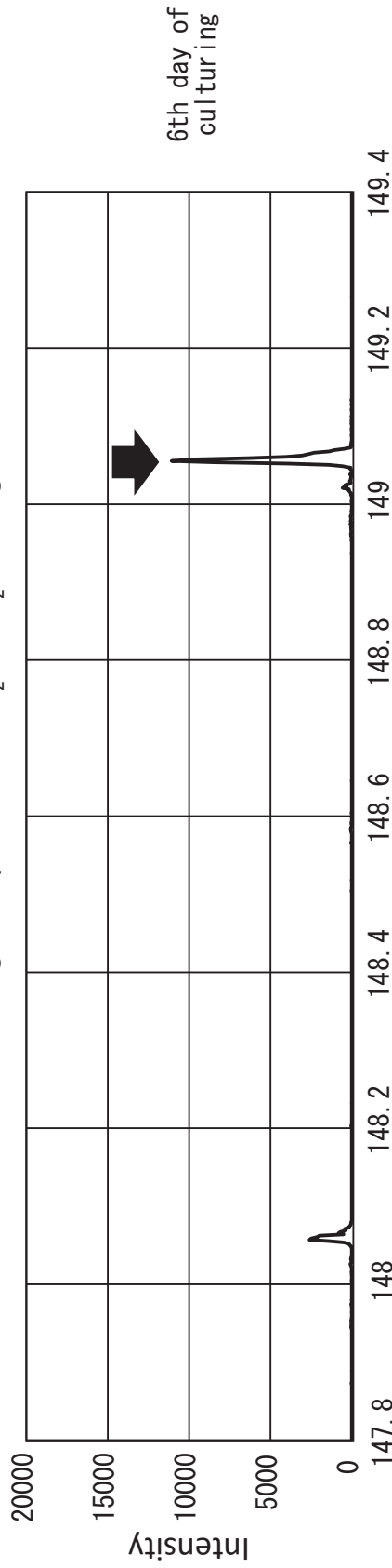




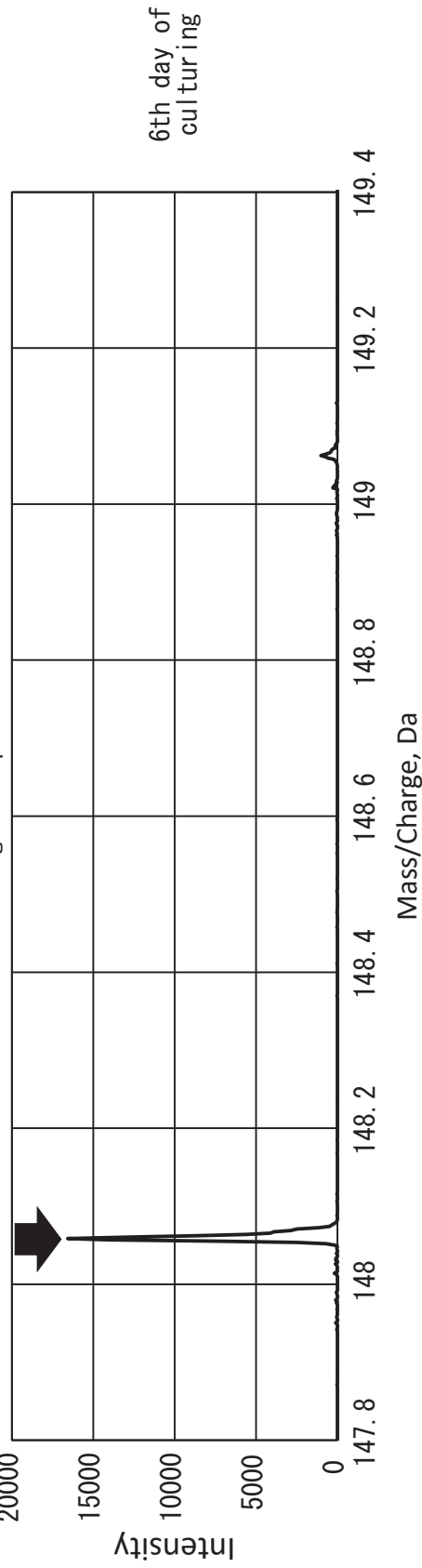
Fig. 2

$^{15}\text{N}_2$ gas experiment

Results of analyzing molecular weight of L-glutamic acid accumulated in medium after culturing NG13-pCCS under $^{15}\text{N}_2$ and O_2 mixed gas



Results of analyzing molecular weight of L-glutamic acid accumulated in medium after culturing NG13-pCCS under air



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Fig. 3

(Sequence of *K. oxytoca* NG13 cloned citrate synthase gene)

5' → 3' sequence. Underline indicates citrate synthase gene region.

AGGAGACCATAAAATGTCTGATGCTAAAGCAAAAATCACCTGGGTGGTGATACTGCTATCGAACTGGATGTGCTAAAGG
GCACGCTCGGTGAGGATGTTATTGATATTCGTAGTCTTGGTTCAAAAGGCGTATTTACTTTTGACCCTGGTTTCACCTCA
ACCGCATCCTGCGAATCTAAATCACCTTTATCGACGGTGATGAAGGTATCCTGCTGCACCGCGGTTTTCCGATCGATCA
GTTAGCAACCGACTCCAATATCTGGAAGTATGCTACATCCTGCTGAACGGTGAGAAGCCGACTCAGGCCAGTACGACG
AATTCAAAACAATCGTTACTCGCCACACTATGATTCACGAACAGATTACCCGTCTGTTCCACGCGTTCCGCCGCGATTCA
CATCCGATGGCGTTATGTGCGGTATCACCGGCGCGCTGGCCGCGTTCTATCACGATTCGCTGGATGTGAATAACCCACG
CCATCGCGATATCGCCGATTCCGCCTGCTCTCCAAGATGCCGACGATGGCGGCAATGTGTTACAAATATTCTATCGGTC
AGCCTTTGTTTTATCCGCGCAACGACCTCTCCTACGCGGGTAACCTTCTGAATATGATGTTCTCCACGCCGTGTGAAAAA
TATGAAGTGAACCCGATTCTGGAACGCGCGATGGACCGTATCCTGATCCTGCACGCCGACCACGAACAAAACGCTTCGAC
CTCCACCGTGCGTACCGCCGGCTCTTCCGGCGCGAACCCTTTGCGTGCATCGCAGCGGGCATTGCCTCCCTGTGGGGAC
CGGCGCACGGCGCGCCAACGAAGCGGCGCTGAAGATGCTCGAAGAGATCAGCTCCGTTGAACACATTCCGGAATTCGTT
CGTCGGCGGAAAGACAAAACGACTCTTTCCGCCTGATGGGCTTTGGCCACCGGGTGACAAAACACTACGACCCGCGCGC
CACCGTTATGCGTGAAACCTGCCATGAAGTGTGAAAGAGCTGGGCACCAAAGACGATCTGCTGGAAGTGGCTATGGAGC
TTGAGCACATCGCGCTTAACGACCCGTACTTCATTGAGAAGAACTTTACCCTAACGTCGATTTCTACTCCGGTATCATC
CTCAAAGCGATGGGCATCCCATCCTCCATGTTTACCGTTATCTTCGCGATGGCGGTACCGTGGGCTGGATTGCGCACTG
GAACGAAATGCACAGCGACGGCATGAAAATAGCCGTCCGCGTCAGCTGTATACCGGTACGAAAAGCGCGATTTCAAAA
ACGATATCGCCCGCTAAGTCGGCTAT (SEQ ID NO: 1)

Fig. 4

(Sequence of *K. oxytoca* NG13 cloned citric acid:Na⁺ symporter gene)

5' → 3' sequence. Underline indicates citric acid:Na⁺ symporter gene region.

GCAGTTTGAAGGATGATGTGTATATTCTTTTTTTAACAGGGTGACGTCATATGACTAATATGAGCCAGGCTCCATCTG
CAGAGAAAAAAGGCGTTAGCGATATTCTGGGGTTTAAATCTTCGGCATGCCGCTACCGCTTTACGCCTTTGCGTTAATC
ACTTTACTACTTTACACTTTTATAATGCCCTGCCGACCGACATTGTGGCGGCTTCGCCATCATGTTTATTATTGGCGC
CGTTTTTGGAGAAATTGGCAAACGCCTGCCGATCTTCAATAAATATATCGGCGGCGCGCGGTGATGATCTTCCTCGTGG
CCGCCTATTTGTTTTATGCAGGCATTTTACCCAGAAAGAAATTGATGCGATCACTAATGTGATGGATAAAAGTAACCTC
CTGAACTTATTCATCGCAGTATTGATTACTGGTGCAATCCTCTCGGTTAACCGTAAGCTGCTGCTGAAATCTCTGCTGGG
TTATATTCCGACCATTTTAATGGGGATCCTCGGCGCATCCATCTTCGGGATTCTCATCGGCTTGCTTCCGGTATCTCCA
TGACCGCATTATGATGCTGTACGTCCTGCCGATTATGGGTGGCGGCAACGGCGCGGGCGCGGTGCCGCTATCTGAAATT
TATCACTCCGTACCGGCGGTTTCGCGTGAAGAGTACTACTCCACCGCGATTGCTATCCTGACCATCGCCAACATCTTGC
CATCGTGTTTTGCCGCGCTGCTCGATATTATCGGTAAAAAGCACACCTGGCTGAGCGGCGAAGGCGAGCTGGTGCGCAAGG
CCTCTTTCAAAGTAGAAGATGATGAAAAAGCGGGCCAGATTACCCATCGCGAAACGGCCGTGGGCTGGTGCTCGCCACA
ACCTGCTTCCTGCTGGCCTACGTTATCGCCAAGAAAATTCTGCCAAGCATTGGCGGGCTATCTATCCACTATTTGCGCTG
GATGGTGCTGATCGTCGCGGCGCTGAACGCTTCGGGCTCTGCTCGCCTGAGATTAAAGCTGGCGCTAAACGCCTATCTG
ACTTCTTCTAAGCAACTGCTGTGGGTACTGATGGTGGCGCTGGCGTGTGCTACACCGACCTGCAGGAAATTATCGAC
GCGATTACCTTTGCGAACGTCATCATCGCGGCGGTGATCGTGTGGGCGCGGTATCGGCGCGGCCATCGGCGGCTGGAT
GATTGGCTTCTTCCGATTGAATCCGCGATCACCGCCGGTCTGTGCATGGCTAACCGCGGCGGCTCGGGCGACCTGGAAG
TACTCTGCTGCTGAACCGTATGAATCTTATCTTATGCGCAAATCTCCTCCGCTCTGGGCGGCGGTATTGTGCTGGTC
ATTGCCAGCATCGTGTTCCGCATGATGATGTAACCAACACGCACGATGGCGATGTTTGAGCGTCAACCACAGCGGTGCT
ATTT (SEQ ID NO: 2)

Fig. 5

Sequence of *C. glutamicum* ATCC13869 citrate synthase gene

ATGTTTGAAAGGGATATCGTGGCTACTGATAACAACAAGGCTGTCCTGCACTACCCGGTGGCGAGTTCGAAATGGACAT
CATCGAGGCTTCTGAGGGTAACAACGGTGTGTCTGGGCAAGATGCTGTCTGAGACTGGACTGATCACTTTTGACCCAG
GTTATGTGAGCACTGGCTCCACCGAGTCGAAGATCACCTACATCGATGGCGATGCGGGAATCCTGCGTTACCGCGGCTAT
GACATCGCTGATCTGGCTGAGAATGCCACCTTCAACGAGGTTTCTTACCTACTTATCAACGGTGAGCTACCAACCCAGA
TGAGCTTCACAAGTTTAACGACGAGATTGCCACCACACCCCTTCTGGACGAGGACTTCAAGTCCCAGTTCAACGTGTTCC
CACGCGACGCTACCCAATGGCAACCTTGGCTTCTCGGTAAACATTTTGTCTACCTACTACCAGGATCAGCTGAACCCA
CTCGATGAGGCACAGCTTGATAAGGCAACCGTTCGCCTCATGGCAAAGGTTCCAATGCTGGCTGCGTACGCACACCGCGC
ACGCAAGGGTGCTCCTTACATGTACCCAGACAACCTCCCTCAACGCGCGTGAGAACTTCTGCGCATGATGTTGCGTTACC
CAACCGAGCCATACGAGATCGACCAATCATGGTCAAGGCTCTGGACAAGCTGCTCATCTGCACGCTGACCACGAGCAG
AACTGCTCCACCTCCACCGTTCGTATGATCGGTTCCGCACAGGCCAACATGTTTGTCTCCATCGCTGGTGGCATCAACGC
TCTGTCCGGCCCACTGCACGGTGGCGCAAACCAGGCTGTTCTGGAGATGCTCGAAGACATCAAGAACAACCAGGTGGCG
ACGCAACCGCGTTTATGAACAAGGTCAAGAACAAGGAAGACGGCGTCCGCCTCATGGGCTTCGGACACCGCGTTTACAAG
AACTACGATCCACGTGCAGCAATCGTCAAGGAGACCGCACACGAGATCCTCGAGCACCTCGGTGGCGACGATCTTCTGGA
TCTGGCAATCAAGCTGGAAGAAATTGCACTGGCTGATGATTGCTTCATCTCCGCAAGCTCTACCCGAACGTAGACTTCT
ACACCGGCTGATCTACCGCGCAATGGGCTTCCCACTGACTTCTTACCGTATTGTTGCGAATCGGTGCTCTGCCAGGA
TGGATCGCTCACTACCGCGAGCAGCTCGGTGCAGCAGGCAACAAGATCAACCGCCACGCCAGGTCTACACCGGCAAGGA
ATCCCGCAAGTTGGTTCTCGCGAGGAGCGCTAA (SEQ ID NO: 3)

Fig. 6

Sequence of *C. glutamicum* ATCC13869 2-methylcitrate synthase gene

ATGTCCAGCGCCACAACCACTGATGTTTCGAAAGGACTCTACGGAGTCATCGCGGATTACACGGCCGTTTCCAAAGTCAT
GCCAGAGACCAATTCACTGACCTACCGTGCTACGCGGTGGAAGATTGGTGGAAAAGTGCAGTTTCGAGGAGGTGTTTT
ACCTCCTGTGGCACGGCGAGCTGCCACTGCGCAACAACCTTGGGAGTTCAATGAGCGTGGCCGTTTCTACCGCTCCCTG
GATGCCGTTTGTATCTCCCTGATCCACTCTTTGCCAAAGAAGCCACCCGATGGATGTTATGCGCACCGCGGTGTCCTA
CATGGGCACCAAGGATTCCGAGTATTTACCACCGATTCTGAGCACATCCGCAAAGTCGGCCACACCTTGTGCGCAGC
TTCCGATGGTGCTAGCCATGGATATTCGTGCGCGCAAGGGCTCGATATCATCGCCCTGACTCCAGCAAGTCAGTCGCC
GAAAACCTGCTGTCTATGGTGTGTTGGCACCGGCCGAGTCGCTGCATCTAACCAGCTGACGTCCGCGATTTTGAGAA
ATCACTGATCCTCTACGCCGAGCACTCCTTCAACGCCTCCACCTTACCGCCCGCGTGATCACCTCCACCAAATCGGATG
TGTAATCCGCAATCACCGGCGCGATCGGTGCTCTCAAGGGCCATTGCACGGTGGCGCCAACGAGTTTGTATGCACACC
ATGTTGGCGATCGACGATCCCAACAAGGCCGCCGACTGGATCAACAACGCTTTGGACAACAAGATGTGGTCATGGGCTT
TGGCCACCGCGTGTACAAGCGCGGCGATTCCCGCGTGCCATCGATGGAGAAGTCCTTCCGGGAATTAGCTGCCCCGCCACG
ACGGCGAAAAGTGGGTTGCCATGTATGAAAACATGCGCGACGCCATGGACGCCCGCACCGGCATCAAGCCGAATCTCGAT
TTCCCCGCTGGCCCTGCCTACCACCTGCTCGGCTTCCCGGTGATTTCTTACCCCGCTGTTGTCATCGCGCGCGTCGC
CGGCTGGACCGCACACATCGTGAGCAGTACGAAAACAACCTCGCTCATCCGCCCACTGTCCGAGTACAACGGCGAGGAGC
AGCGCGAGGTGCGGCCATTGAAAAGCGTTAA (SEQ ID NO: 4)

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Fig. 7

Sequence of *E. coli* W3110 2-methylcitrate synthase gene

ATGAGCGACACAACGATCCTGCAAAACAGTACCCATGTCATTAAACCGAAAAATCTGTGGCACTTTCTGGCGTTCCGGC
GGGCAATACGGCGCTCTGCACCGTGGGTAAAAGTGGCAATGACCTGCATTACCGCGGCTACGATATTCTTGATCTGGCGA
AACATTGCGAATTTGAAGAAGTGGCGCATCTGCTGATCCACGGCAAACCTGCCGACCCGTGACGAACTGCGCGCTTACAAA
ACGAAACTGAAAGCCCTGCGCGGTTTACCGGCTAACGTGCGTACCGTGTGGAAGCCTTACCGGCGGCGTCGCACCCGAT
GGATGTTATGCGCACCGGTGTTTCCGCGCTCGGCTGCACGCTGCCAGAAAAAGAGGGGCATACCGTCTCTGGCGCGCGGG
ATATTGCCGACAACTGCTGGCGTCGCTTAGCTCGATTCTCCTTTATTGGTATCACTACAGCCACAACGGCGAACGCATC
CAACCGGAAACCGATGACGACTCCATCGGCGGTCACTTCCTGCATCTGCTGCACGGCGAAAAGCCATCGCAAAGCTGGGA
AAAGGCGATGCATATCTCGCTGGTGTGTACGCCGAACACGAGTTTAACGCCTCCACCTTTACCAGTCGGGTGATTGCGG
GCACCGGCTCTGATATGTATTCCGCGATTATTGGCGGATTGGCGCACTGCGCGGGCCAAAACACGGCGGGGCGAATGAA
GTGTGCTGGAGATCCAGCAACGCTACGAAACGCCGGACGAAGCCGAAGCAGATATCCGCAAGCGCGTGGAAAACAAAGA
AGTGGTCATTGTTTTGGTCATCCGGTTTACACCATCGCTGACCCGCGCCACCAGGTGATTAAACGTGTGGCGAAGCAGC
TCTCGCAGGAAGGCGGCTCGCTGAAGATGTACAACATCGCCGATCGCCTGGAACGGTGATGTGGGAGAGCAAAAAGATG
TTCCCAATCTCGACTGGTTCTCTGCTGTTTCTACAACATGATGGGCGTTCACCCGAGATGTTACACCACTGTTTGT
TATCGCCCGCGTCACCGGCTGGGCGGCGCACATTATCGAACAACGTGAGGACAACAAAATTATCCGTCCTTCCGCCAATT
ATGTTGGACCGGAAGACCGCCCGTTTGTGCGCTGGATAAGCGCCAGTAA (SEQ ID NO: 5)

Fig. 8

Nucleotide sequence of *K. oxytoca* NG13 cloned glutamate-pyruvate aminotransferase gene

ATGGCTGAATTAGTCTGAACGCCGTTTTACGCGTATCGATCGTCTCCCCCGTACGTTTTTAATATCACTGCTGA
GCTGAAAATGGCTGCGCGACGCCGCGCGGAAGATATTATTGATTTAGCATGGGTAAACCCCGATGGCGCGACCCCGC
CGCATATCGTTGAGAAGCTATGCACCGTTGCCAGCGTCCCGATACGCACGGCTATTCCACCTCTCGCGGTATTCCG
CGTCTGCGCCGGCGGATTTCTCGTTGGTATCAAGAGCGCTATAACGTTGAGATCGATCCGGAATCAGAAGCGATAGT
AACCATTGGTTCAAAAGAGGGACTGGCGCATCTGATGCTGGCGACGCTTGACCATGGCGATACCGTACTGGTGCCGA
ATCCCAGCTATCCTATTCACATTTATGGGGCGGTAATCGCCGGAGCCAGGTGCGTTCACTACCTCTCGTTGAAGGC
GTGGATTTTTTCAATGAGCTCGAGCGCGCCATTGCGGAGAGTTACCCGAAGCCGAAAATGATGATCCTCGGTTTCCC
TTCCAACCCGACCGCGCAGTGCCTGAACTGGAGTCTTTGAGAAAGTCTGGCGTTGGCGAAGCGTTATGACGTAC
TGTTGTGCACGATTTGGCCTACGCCGATATTGTTTATGATGGCTGGAAGCGCCCTCTATTATGCAGGTTCCCGGC
GCGCGCGATGTTGCCGTGGAATCTTTACGCTATCGAAAAGCTACAATATGGCGGGCTGGCGTATCGGCTTTATGGT
TGGCAACAAAACGTTGGTTAATGCGCTGGCGCGTATTAAGAGCTACCACGACTACGGCACCTTACCCCTCTACAGG
TTGCGGCTATTGCGGCGCTTGAAGGCGATCAGCAGTGCCTTCGTGACATTGCCGAGCAGTATAAGCGCCGTCGCGAT
GTGCTGGTGAAGGACTGCATGAGGCCGGATGGATGGTGAATGTCCGAAGGCGTCAATGTATGTATGGGCGAAGAT
CCCTGAACAGTATGCGGCGATGGGCTCACTGGAGTTCGCTAAAAAGCTGCTGCAGGATGCTAAAGTCTGCGTTTCGC
CGGGCATTGGCTTCGGGGACTACGGCGATACGCACGTACGCTTCGCTTTAATTGAAAACCGCGATCGTATCCGCCAG
GCGGTGCGCGGCATTAAATCCATGTTTCGTGCAGACGGGCTGCTGCCCGCTCGACGAAGTTAACGACGGAAGCAA
CGAATAA (SEQ ID NO: 33)

Fig. 9

Nucleotide sequence of *K. oxytoca* NG13 cloned L-alanine transporter gene

ATGTTCTCTGCGCAGTCCCGCTTGCGTCATGCGGTAGCAGACACCTTTGCGATGGTGGTTTACTGCACCGTTGTGAA
CATGATGATCGAAATTTTTCTCTCCGGAATGACCTTCCAGCAGTCGTTATCTTCGCGACTGGTGGCGATTCCGGTGA
ACATTATTATTGCCGTGCCTTACGGCTTTTATCGCGATTTGCGGATGCGCCAGGCGCGCCGCATCAGCGCGTCCGGC
TGGATGAAGAATATTGCCGATGTAGTGGCCTATGTGACGTTCCAGTCGCCGGTATACGTGGCGATTCTGCTGGTTGT
TGGCGCCGACTGGCATCAGATCGCCGCGGGTAAGTTCCAATATCGTTGTATCAATGATGATGGGCGCAGCGTACG
GTTATTTCTCGACTACTGCCGTCGCCTGTTCCGCGTCAGCCCCCTACCTGCAGGCCAAAGCCTGAGTTGA

(SEQ ID NO: 34)

Fig. 10

Nucleotide sequence of *E. coli* MG1655 glutamate-oxaloacetate aminotransferase gene

ATGTTTGAGAACATTACCGCCGCTCCTGCCGACCCGATTCTGGGCCTGGCCGATCTGTTTCGTGCCGATG
AACGTCCCGGCAAAATTAACCTCGGGATTGGTGTCTATAAAGATGAGACGGGCAAAACCCCGTACTGAC
CAGCGTGAAAAAGGCTGAACAGTATCTGCTCGAAAATGAAACCAACAAAAATTACCTCGGCATTGACGGC
ATCCCTGAATTTGGTCGCTGCACTCAGGAAGTCTGTTTGGTAAAGGTAGCGCCCTGATCAATGACAAAC
GTGCTCGCACGGCACAGACTCCGGGGGGCACTGGCGCACTACGCGTGGCTGCCGATTTCTGGCAAAAAA
TACCAGCGTTAAGCGTGTGTGGGTGAGCAACCAAGCTGGCCGAACCATAAGAGCGTCTTTAACTCTGCA
GGTCTGGAAGTTCTGAATACGCTTATTATGATGCGGAAAAATCACACTCTTGACTTCGATGCACTGATTA
ACAGCCTGAATGAAGCTCAGGCTGGCGACGTAGTGCTGTTCCATGGCTGCTGCCATAACCCAACCGGTAT
CGACCCTACGCTGGAACAATGGCAAACTGGCACAACCTCTCGTTGAGAAAGGCTGGTTACCGCTGTTT
GACTTCGCTTACCAGGGTTTTGCCGCTGGTCTGGAAGAAGATGCTGAAGGACTGCGCGCTTTGCGGGCTA
TGCATAAAGAGCTGATTGTTGCCAGTTCCTACTCTAAAACTTTGGCCTGTACAACGAGCGTGTGGCGC
TTGTAATCTGGTTGCTGCCGACAGTGAAACCGTTGATCGCGCATTGAGCCAAATGAAAGCGGCGATTGCG
GCTAACTACTCTAACCCACCGACACACGGCGCTTCTGTTGTTGCCACCATCCTGAGCAACGATGCGTTAC
GTGCGATTTGGGAACAAGAGCTGACTGATATGCGCCAGCGTATTGAGCGTATGCGTCAGTTGTTGCTCAA
TACGCTGCAGGAAAAAGGCGCAAACCGCGACTTCAGCTTTATCATCAAACAGAACGGCATGTTCTCCTTC
AGTGGCCTGACAAAAGAACAAGTGTGCGTCTGCGCGAAGAGTTTGGCGTATATGCGGTTGCTTCTGGTC
GCGTAAATGTGGCCGGGATGACACCAGATAACATGGCTCCGCTGTGCGAAGCGATTGTGGCAGTGCTGTA
A (SEQ ID NO: 35)

Fig. 11

Nucleotide sequence of *E. coli* MG1655 glutamate decarboxylase gene

```
ATGGATAAGAAGCAAGTAACGGATTTAAGGTCGGAAC TACTCGATTACGTTTTTGGTGCGAAGTCTATTT
CCACTATCGCAGAATCAAAACGTTTTCCGCTGCACGAAATGCGCGACGATGTCGCATTCCAGATTATCAA
TGACGAATTATATCTTGATGGCAACGCTCGTCAGAACCTGGCCACTTTCTGCCAGACCTGGGACGACGAA
AATGTCCACAAATTGATGGATTTATCCATTAACAAAACTGGATCGACAAAGAAGAATATCCGCAATCCG
CAGCCATCGACCTGCGTTGCGTAAATATGGTTGCCGATCTGTGGCATGCGCCTGCGCCGAAAAATGGTCA
GGCCGTTGGCACCAACACCATTGGTTCTTCCGAGGCCTGTATGCTCGGCGGGATGGCGATGAAATGGCGT
TGGCGCAAGCGTATGGAAGCTGCAGGCAAACCAACGGATAAACCAAACCTGGTGTGCGGTCCGGTACAAA
TCTGCTGGCATAAATTCGCCCGCTACTGGGATGTGGAGCTGCGTGAGATCCCTATGCGCCCCGGTCAGTT
GTTTATGGACCCGAAACGCATGATTGAAGCCTGTGACGAAAACACCATCGGCGTGGTGCCGACTTTTCGGC
GTGACCTACACTGGTAACTATGAGTTCCCACAACCGCTGCACGATGCGCTGGATAAATTCAGGCCGATA
CCGGTATCGACATCGACATGCACATCGACGCTGCCAGCGGTGGCTTCCTGGCACCGTTCTGTCGCCCGGA
TATCGTCTGGGACTTCGGCCTGCCGCGTGTGAAATCGATCAGTGCTTCAGGCCATAAATTCGGTCTGGCT
CCGCTGGGCTGCGGCTGGGTTATCTGGCGTGACGAAGAAGCGCTGCCGCAGGAAC TGGTGTTCAACGTTG
ACTACCTGGGTGGTCAAATTGGTACTTTTGCCATCAACTTCTCCCGCCCGGCGGGTCAGGTAATTGCACA
GTACTATGAATTCCTGCGCCTCGGTCTGAAGGCTATACCAAAGTACAGAACGCCTCTTACCAGGTTGCC
GCTTATCTGGCGGATGAAATCGCCAAACTGGGGCCGTATGAGTTCATCTGTACGGGTGCGCCGGACGAAG
GCATCCCGGCGGTTTGCTTCAAAC TGAAGATGGTGAAGATCCGGGATACACCCTGTATGACCTCTCTGA
ACGTCTGCGTCTGCGCGGCTGGCAGGTTCCGGCCTTCACTCTCGGCGGTGAAGCCACCGACATCGTGGTG
ATGCGCATTATGTGTCGTGCGGCTTCGAAATGGACTTTGCTGAACTGTTGCTGGAAGACTACAAAGCCT
CCCTGAAATATCTCAGCGATCACCCGAAACTGCAGGGTATTGCCCAACAGAACAGCTTTAAACATACCTG
A (SEQ ID NO: 36)
```

Fig. 12

Results of analyzing molecular weight of L-glutamic acid accumulated
in medium after culturing *R. aquatilis*-pCCS-pKCT under $^{15}\text{N}_2$ and O_2 mixed gas

