**AMB Express**

**Solid-state fermentation of** **distilled dried grain with solubles with probiotics for degrading lignocellulose and upgrading nutrient utilization**

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**CW4**

**CGMCC No:12825**

Morphological, biochemical tests and sequence analysis showed that the identified strain was ***Bacillus subtilis.***

Table S1: biochemical tests of CW4

|  |  |
| --- | --- |
| Item | [Identification result](http://dict.cnki.net/dict_result.aspx?searchword=%e9%89%b4%e5%ae%9a%e7%bb%93%e6%9e%9c&tjType=sentence&style=&t=identification+result) |
| Contact enzyme | + |
| Anaerobic growth | - |
| VP test | + |
| Sugar fermentation (Glucose, xylose, [arabinose](https://www.baidu.com/link?url=arh-Su-CdT6arZ9OgXtUjTBknZeMsieHpeVSKjyhxL6qYsD3wDNCkLIBoT6c7NmZ-RMOUDsmNKr_1sB0O953vmMQn3C1m5NMRTsrnukFJ67&wd=&eqid=f88c2bb600007beb0000000458d8c581), mannitol) | + |
| Gas production by glucose | - |
| Nitrate reduction | + |
| 6.5% Nacl growth | + |
| Starch hydrolysis | + |
| Gelatin liquefaction | + |

“+”: positive; “-”: negative

**CWLP**

**CGMCC No: 1.510**

16S rRNA sequence analysis showed that the identified strain was a ***Lactobacillus plantarum* strain.**

**16S rRNA: 1344bp**

TGCATCTTGATTTACATTTGAGTGAGTGGCGAACTGGTGAGTAACACGTGGGAAACCTGCCCAGAAGCGGGGGATAACACCTGGAAACAGATGCTAATACCGCATAACAACTTGGACCGCATGGTCCGAGCTTGAAAGATGGCTTCGGCTATCACTTTTGGATGGTCCCGCGGCGTATTAGCTAGATGGTGGGGTAACGGCTCACCATGGCAATGATACGTAGCCGACCTGAGAGGGTAATCGGCCACATTGGGACTGAGACACGGCCCAAACTAATACGGGAGGCAGCAGTAGGGAATCTTCCACAATGGACGAAAGTCTGATGGAGCAACGCCGCGTGAGTGAAGAAGGGTTTCGGCTCGTAAAACTCTGTTGTTAAAGAAGAACATATCTGAGAGTAACTGTTCAGGTATTGACGGTATTTAACCAGAAAGCCACGGCTAACTACGTGCCAGCAGCCGCGGTAATACGTAGGTGGCAAGCGTTGTCCGGATTTATTGGGCGTAAAGCGAGCGCAGGCGGTTTTTTAAGTCTGATGTGAAAGCCTTCGGCTCAACCGAAGAAGTGCATCGGAAACTGGGAAACTTGAGTGCAGAAGAGGACAGTGGAACTCCATGTGTAGCGGTGAAATGCGTAGATATATGGAAGAACACCAGTGGCGAAGGCGGCTGTCTGGTCTGTAACTGACGCTGAGGCTCGAAAGTATGGGTAGCAAACAGGATTAGATACCCTGGTAGTCCATACCGTAAACGATGAATGCTAAGTGTTGGAGGGTTTCCGCCCTTCAGTGCTGCAGCTAACGCATTAAGCATTCCGCCTGGGGAGTACGGCCGCAAGGCTGAAACTCAAAGGAATTGACGGGGGCCCGCACAAGCGGTGGAGCATGTGGTTTAATTCGAAGCTACGCGAAGAACCTTACCAGGTCTTGACATACTATGCAAATCTAAGAGATTAGACGTTCCCTTCGGGGACATGGATACAGGTGGTGCATGGTTGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAGCGCAACCCTTATTATCAGTTGCCAGCATTAAGTTGGGCACTCTGGTGAGACTGCCGGTGACAAACCGGAGGAAGGTGGGGATGACGTCAAATCATCATGCCCCTTATGACCTGGGCTACACACGTGCTACAATGGATGGTACAACGAGTTGCGAACTCGCGAGAGTAAGCTAATCTCTTAAAGCCATTCTCAGTTCGGATTGTAGGCTGCAACTCGCCTACATGAAGTCGGAATCGCTAGTAATCGCGGATCAGCATGCCGCGGTGAATACGTTCCCGGGCCTTGTACACACCGCCCGTCTAC

Table S2: BLAST results of CWLP

| Description | [Max score](https://blast.ncbi.nlm.nih.gov/Blast.cgi?CMD=Get&ALIGNMENTS=10&ALIGNMENT_VIEW=Pairwise&DATABASE_SORT=0&DESCRIPTIONS=10&DYNAMIC_FORMAT=on&FIRST_QUERY_NUM=0&FORMAT_OBJECT=Alignment&FORMAT_PAGE_TARGET=&FORMAT_TYPE=HTML&GET_SEQUENCE=yes&I_THRESH=&LINE_LENGTH=60&MASK_CHAR=2&MASK_COLOR=1&NUM_OVERVIEW=10&PAGE=MegaBlast&QUERY_INDEX=0&QUERY_NUMBER=0&RESULTS_PAGE_TARGET=&RID=2YWRW7B0015&SHOW_LINKOUT=yes&SHOW_OVERVIEW=yes&STEP_NUMBER=&OLD_VIEW=false&DISPLAY_SORT=1&HSP_SORT=1) | [Total score](https://blast.ncbi.nlm.nih.gov/Blast.cgi?CMD=Get&ALIGNMENTS=10&ALIGNMENT_VIEW=Pairwise&DATABASE_SORT=0&DESCRIPTIONS=10&DYNAMIC_FORMAT=on&FIRST_QUERY_NUM=0&FORMAT_OBJECT=Alignment&FORMAT_PAGE_TARGET=&FORMAT_TYPE=HTML&GET_SEQUENCE=yes&I_THRESH=&LINE_LENGTH=60&MASK_CHAR=2&MASK_COLOR=1&NUM_OVERVIEW=10&PAGE=MegaBlast&QUERY_INDEX=0&QUERY_NUMBER=0&RESULTS_PAGE_TARGET=&RID=2YWRW7B0015&SHOW_LINKOUT=yes&SHOW_OVERVIEW=yes&STEP_NUMBER=&OLD_VIEW=false&DISPLAY_SORT=2&HSP_SORT=1) | [Query cover](https://blast.ncbi.nlm.nih.gov/Blast.cgi?CMD=Get&ALIGNMENTS=10&ALIGNMENT_VIEW=Pairwise&DATABASE_SORT=0&DESCRIPTIONS=10&DYNAMIC_FORMAT=on&FIRST_QUERY_NUM=0&FORMAT_OBJECT=Alignment&FORMAT_PAGE_TARGET=&FORMAT_TYPE=HTML&GET_SEQUENCE=yes&I_THRESH=&LINE_LENGTH=60&MASK_CHAR=2&MASK_COLOR=1&NUM_OVERVIEW=10&PAGE=MegaBlast&QUERY_INDEX=0&QUERY_NUMBER=0&RESULTS_PAGE_TARGET=&RID=2YWRW7B0015&SHOW_LINKOUT=yes&SHOW_OVERVIEW=yes&STEP_NUMBER=&OLD_VIEW=false&DISPLAY_SORT=4&HSP_SORT=0) | [E value](https://blast.ncbi.nlm.nih.gov/Blast.cgi?CMD=Get&ALIGNMENTS=10&ALIGNMENT_VIEW=Pairwise&DATABASE_SORT=0&DESCRIPTIONS=10&DYNAMIC_FORMAT=on&FIRST_QUERY_NUM=0&FORMAT_OBJECT=Alignment&FORMAT_PAGE_TARGET=&FORMAT_TYPE=HTML&GET_SEQUENCE=yes&I_THRESH=&LINE_LENGTH=60&MASK_CHAR=2&MASK_COLOR=1&NUM_OVERVIEW=10&PAGE=MegaBlast&QUERY_INDEX=0&QUERY_NUMBER=0&RESULTS_PAGE_TARGET=&RID=2YWRW7B0015&SHOW_LINKOUT=yes&SHOW_OVERVIEW=yes&STEP_NUMBER=&OLD_VIEW=false&DISPLAY_SORT=0&HSP_SORT=0) | [Ident](https://blast.ncbi.nlm.nih.gov/Blast.cgi?CMD=Get&ALIGNMENTS=10&ALIGNMENT_VIEW=Pairwise&DATABASE_SORT=0&DESCRIPTIONS=10&DYNAMIC_FORMAT=on&FIRST_QUERY_NUM=0&FORMAT_OBJECT=Alignment&FORMAT_PAGE_TARGET=&FORMAT_TYPE=HTML&GET_SEQUENCE=yes&I_THRESH=&LINE_LENGTH=60&MASK_CHAR=2&MASK_COLOR=1&NUM_OVERVIEW=10&PAGE=MegaBlast&QUERY_INDEX=0&QUERY_NUMBER=0&RESULTS_PAGE_TARGET=&RID=2YWRW7B0015&SHOW_LINKOUT=yes&SHOW_OVERVIEW=yes&STEP_NUMBER=&DISPLAY_SORT=3&HSP_SORT=3) | Accession |
| --- | --- | --- | --- | --- | --- | --- |
| [*Lactobacillus plantarum* strain UNIFG122 16S ribosomal RNA gene, partial sequence](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_807781557)  | 2466 | 2466 | 99% | 0.0 | 99% | [KP899091.1](https://www.ncbi.nlm.nih.gov/nucleotide/KP899091.1?report=genbank&log$=nucltop&blast_rank=1&RID=2YWRW7B0015)  |
| [*Lactobacillus plantarum* strain UNIFG108 16S ribosomal RNA gene, partial sequence](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_807781550)  | 2466 | 2466 | 99% | 0.0 | 99% | [KP899084.1](https://www.ncbi.nlm.nih.gov/nucleotide/KP899084.1?report=genbank&log$=nucltop&blast_rank=2&RID=2YWRW7B0015)  |
| [*Lactobacillus plantarum* strain UNIFG107 16S ribosomal RNA gene, partial sequence](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_807781549)  | 2466 | 2466 | 99% | 0.0 | 99% | [KP899083.1](https://www.ncbi.nlm.nih.gov/nucleotide/KP899083.1?report=genbank&log$=nucltop&blast_rank=3&RID=2YWRW7B0015)  |
| [*Lactobacillus plantarum* strain HL14403 16S ribosomal RNA gene, partial sequence](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_1280037503)  | 2460 | 2460 | 99% | 0.0 | 99% | [KY417131.1](https://www.ncbi.nlm.nih.gov/nucleotide/KY417131.1?report=genbank&log$=nucltop&blast_rank=4&RID=2YWRW7B0015)  |
| [*Lactobacillus plantarum* strain 3B2 16S ribosomal RNA gene, partial sequence](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_1279653780)  | 2460 | 2460 | 99% | 0.0 | 99% | [MG561858.1](https://www.ncbi.nlm.nih.gov/nucleotide/MG561858.1?report=genbank&log$=nucltop&blast_rank=5&RID=2YWRW7B0015)  |
| [*Lactobacillus plantarum* strain NWAFU1529 16S ribosomal RNA gene, partial sequence](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_1279336855)  | 2460 | 2460 | 99% | 0.0 | 99% | [MG551199.1](https://www.ncbi.nlm.nih.gov/nucleotide/MG551199.1?report=genbank&log$=nucltop&blast_rank=6&RID=2YWRW7B0015)  |
| [*Lactobacillus plantarum* strain HY-08 16S ribosomal RNA gene, partial sequence](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_1278992657)  | 2460 | 2460 | 99% | 0.0 | 99% | [MG547899.1](https://www.ncbi.nlm.nih.gov/nucleotide/MG547899.1?report=genbank&log$=nucltop&blast_rank=7&RID=2YWRW7B0015)  |
| [*Lactobacillus plantarum* strain NWAFU1285 16S ribosomal RNA gene, partial sequence](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_1276390682)  | 2460 | 2460 | 99% | 0.0 | 99% | [MG462194.1](https://www.ncbi.nlm.nih.gov/nucleotide/MG462194.1?report=genbank&log$=nucltop&blast_rank=8&RID=2YWRW7B0015)  |
| [*Lactobacillus plantarum* strain NWAFU1227 16S ribosomal RNA gene, partial sequence](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_1276390610)  | 2460 | 2460 | 99% | 0.0 | 99% | [MG462122.1](https://www.ncbi.nlm.nih.gov/nucleotide/MG462122.1?report=genbank&log$=nucltop&blast_rank=9&RID=2YWRW7B0015)  |
| [*Lactobacillus plantarum* strain NWAFU1203 16S ribosomal RNA gene, partial sequence](https://blast.ncbi.nlm.nih.gov/Blast.cgi#alnHdr_1276390586)  | 2460 | 2460 | 99% | 0.0 | 99% | [MG462098.1](https://www.ncbi.nlm.nih.gov/nucleotide/MG462098.1?report=genbank&log$=nucltop&blast_rank=10&RID=2YWRW7B0015)  |