Claims

1. A bacterium ~~for degrading sludge~~ having a 16S rRNA gene comprising a nucleotide sequence having 97% or more identity to the nucleotide sequence represented by SEQ ID NO: 1, having at least one of the following characteristics a) to d), and having an ability to degrade a target microorganism;

a) no glucose fermentability

b) no mannitol fermentability

c) citric acid utilization

d) no nitrate reduction,

wherein, the target microorganism is at least one of the following microorganisms 1) to 5);

1) *Micrococcus lysodeikticus*

2) *Saccharomyces cerevisiae*

3) *Escherichia coli*

4) *Brevibacillus parabrevis*

5) *Gluconobacter oxydans*.

~~2. A bacterium having a 16S rRNA gene comprising the nucleotide sequence represented by SEQ ID NO: 1 with mutations of two bases or less, and having an ability to degrade a target microorganism.~~

~~3. The bacterium according to claim 2, wherein the target microorganism is a target bacterium.~~

~~4. The bacterium according to claim 2 or 3, wherein the target microorganism is a target killed bacterium.~~

2~~5~~. The bacterium according to claim 1~~any one of claims 1 to 4~~, having a 16S

rRNA gene comprising the nucleotide sequence represented by SEQ ID NO: 1.

3. The bacterium according to claim 2, wherein the bacterium satisfies at least one of

the 423rd base in SEQ ID NO: 1 being adenine,

the 441st base in SEQ ID NO: 1 being cytosine, and

the 1236th base in SEQ ID NO: 1 being guanine.

4. The bacterium according to any one of claims 1 to 3, wherein ~~the ability to degrade~~ the target microorganism is~~comprises degrading~~ at least killed bacterium of *Micrococcus lysodeikticus*.

5. A bacterium having a 16S rRNA gene comprising a nucleotide sequence represented by SEQ ID NO: 1, and satisfying at least one of

the 423rd base in SEQ ID NO: 1 being adenine,

the 441st base in SEQ ID NO: 1 being cytosine, and

the 1236th base in SEQ ID NO: 1being guanine.

6. A bacterium deposited under Accession number NITE BP-03020.

7. A microbial preparation for degrading sludge, comprising a bacterium (a1) or a culture thereof:

bacterium (a1): ~~a~~ *Brevibacillus parabrevis*~~bacterium~~ having a 16S rRNA gene comprising a nucleotide sequence having 90% or more identity to the nucleotide sequence represented by SEQ ID NO: 1.

~~8. The microbial preparation for degrading sludge according to claim 7, wherein the bacterium (a1) is the bacterium according to any one of claims 1 to 6.~~

~~9. The microbial preparation for degrading sludge according to claim 7, wherein the bacterium (a1) is a bacterium belonging to the genus *Brevibacillus*.~~

~~10. The microbial preparation for degrading sludge according to claim 9, wherein the bacterium (a1) is *Brevibacillus parabrevis*.~~

8~~11~~. The microbial preparation for degrading sludge according to claim 7~~9~~, wherein the bacterium (a1) has a following characteristic: when 50 μL of the culture supernatant of the bacterium (a1) is added to 5.0 mL of a solution containing killed bacterium of the *Micrococcus lysodeikticus* and reacted at 25 °C, a turbidity (OD660) of the solution after addition of the supernatant is 80% or less of the turbidity (OD660) of the solution before addition of the supernatant.

~~8. The microbial preparation for degrading sludge according to claim 7, wherein the bacterium (a1) has a 16S rRNA gene comprising a nucleotide sequence having 95% or more identity to the nucleotide sequence represented by SEQ ID NO: 1.~~

~~9. The microbial preparation for degrading sludge according to claim 7, wherein the bacterium (a1) has a 16S rRNA gene comprising a nucleotide sequence having 97% or more identity to the nucleotide sequence represented by SEQ ID NO: 1.~~

~~10. The microbial preparation for degrading sludge according to claim 7, wherein the bacterium (a1) has a 16S rRNA gene comprising the nucleotide sequence represented by SEQ ID NO: 1.~~

~~11. The microbial preparation for degrading sludge according to any one of claims 7 to 10, wherein the bacterium (a1) has an ability to degrade a target microorganism.~~

~~12. The microbial preparation for degrading sludge according to any one of claims 7 to 11, which degrades sludge at a temperature of 20°C.~~

~~13. The microbial preparation for degrading sludge according to claim 7, wherein the bacterium (a1) is a bacterium deposited under Accession number NITE BP-03020.~~

9~~14~~. The microbial preparation for degrading sludge according to claim 7 or 8~~any one of claims 7 to 13~~, further comprising a microorganism (a2):

microorganism (a2): a microorganism different from bacterium (a1), wherein the percentage of the bacteria (a1) based on the total number of the bacteria (a1) and the microorganism (a2) is 0.1% or more and less than 100%.

10~~15~~. The microbial preparation for degrading sludge according to claim 9~~14~~, wherein the microorganism (a2) has a 16S rRNA gene comprising a nucleotide sequence having 90% or more identity to the nucleotide sequence represented by SEQ ID NO: 7, and comprises at least one species selected from the group consisting of bacteria having an ability to degrade a target microorganism, bacteria of the genus *Bacillus* having an ability to degrade a target microorganism, and bacteria of the genus *Paenibacillus* having an ability to degrade a target microorganism,
wherein the target microorganism of the microorganism (a2) is at least one of the following microorganisms 1) to 7);

1) bacteria of the genus *Micrococcus*

2) bacteria of the genus *Bacillus*

3) bacteria of the genus *Staphylococcus*

4) bacteria of the genus *Lactobacillus*

5) bacteria of the genus *Paenibacillus*

6) bacteria of the genus *Escherichia*

7) bacteria of the genus *Acetobacter*.

~~16. A microbial preparation for degrading sludge, comprising a culture of a bacterium (a1):~~

~~bacterium (a1): a bacterium having a 16S rRNA gene comprising a nucleotide sequence having 90% or more identity to the nucleotide sequence represented by SEQ ID NO: 1, and having an ability to degrade a target microorganism.~~

11~~17~~. A method for degrading sludge, comprising allowing the bacterium according to any one of claims 1 to 6 or the microbial preparation for degrading sludge according to any one of claims 7 to 10~~16~~ to act on sludge.

12~~18~~. A device for degrading sludge, wherein the bacterium according to any one of claims 1 to 6 or the microbial preparation for degrading sludge according to any one of claims 7 to 10~~16~~ is used.