WHAT IS CLAIMED IS:

1. A D-lactic acid-producing strain modified to attenuate or inactivate L-lactate dehydrogenase (L-LDH) activity and to enhance D-lactate dehydrogenase (D-LDH) activity.

2. The strain according to claim 1, wherein a L-LDH-encoding polynucleotide is selected from the group consisting of *ldh* (SEQ ID NO: 25) and *ldh1* (SEQ ID NO: 26)of Lactobacillus paracasei, *ldh1* (SEQ ID NO: 27) and *ldh2* (SEQ ID NO: 28)of Lactobacillus paracasei, *ldh(LGG_02523)* (SEQ ID NO: 29) and *ldh (LGG_00606)*(SEQ ID NO: 30)of Lactobacillus rhamnosus.

3. The strain according to claim 1, wherein a D-LDH-encoding polynucleotide is derived from *Lactobacillus plantarum* or *Lactobacillus delbrueckii*.

4. The strain according to claim 3, wherein the D-LDH-encoding polynucleotide is a LDHA (SEQ ID NO: 31)-encoding polynucleotide of Lactobacillus delbrueckii or a LDHD (SEQ ID NO: 32)-encoding polynucleotide of Lactobacillus plantarum.

5. The strain according to claim 1, wherein one or more of heterogenous D-LDH-encoding polynucleotides are substituted for the L-LDH-encoding polynucleotide in the chromosome and are overexpressed.

6. The strain according to claim 1, wherein the strain is a *Lactobacillus sp* strain.

7. The strain according to claim 1, wherein a polynucleotide encoding LDH1 (SEQ ID NO: 27) and a polynucleotide encoding LDH2 (SEQ ID NO: 28) of *Lactobacillus casei* are substituted with a polynucleotide encoding LDHA (SEQ ID NO: 31) of *Lactobacillus delbrueckii* and a polynucleotide encoding LDHD (SEQ ID NO: 32) of *Lactobacillus plantarum*, respectively.

8. The strain according to claim 1, wherein a polynucleotide encoding LDH (SEQ ID NO: 25) and a polynucleotide encoding LDH1 (SEQ ID NO: 26) of *Lactobacillus paracasei* are substituted with a polynucleotide encoding LDHA (SEQ ID NO: 31) of *Lactobacillus delbrueckii* and a polynucleotide encoding LDHD (SEQ ID NO: 32) of *Lactobacillus plantarum*, respectively.

9. The strain according to claim 8, wherein a polynucleotide encoding LDH(LGG_02523) (SEQ ID NO: 29) and a polynucleotide encoding LDH(LGG_00606) (SEQ ID NO: 30) of *Lactobacillus rhamnosus* are substituted with a polynucleotide encoding LDHA (SEQ ID NO: 31) of *Lactobacillus delbrueckii* and a polynucleotide encoding LDHD (SEQ ID NO: 32) of *Lactobacillus plantarum*, respectively.

10. The strain according to claim 8, wherein it is *Lactobacillus paracasei* CC02-0095 deposieted under the Accession No. KCCM11273P.

11. A method for preparing a modified D-lactic acid-producing strain, comprising:
(a) attenuating or inactivating L-lactate dehydrogenase (L-LDH) activity in an L-lactic acid-producing strain to obtain a modified lactic acid-producing strain; and
(b) introducing or enhancing D-lactate dehydrogenase (D-LDH) activity in the modified lactic acid-producing strain.

12. The method according to claim 11, wherein the L-LDH activity is attenuated or inactivated by substitution, deletion, insertion or addition of an L-LDH-encoding polynucleotide and the L-LDH-encoding polynucleotide is selected from the group consisting of *ldh* (SEQ ID NO: 25) and *ldh1* (SEQ ID NO: 26) of Lactobacillus paracasei, *ldh1* (SEQ ID NO: 27) and *ldh2* (SEQ ID NO: 28) of Lactobacillus casei, *ldh(LGG_02523)* (SEQ ID NO: 29) and *ldh(LGG_00606)* (SEQ ID NO: 30) of Lactobacillus rhamnosus.

13. The method according to claim 11, wherein the D-LDH activity is introduced or enhanced by introducing a D-LDH-encoding polynucleotide into the chromosome of the modified lactic acid-producing strain and the D-LDH-encoding polynucleotide is a polynucleotide encoding LDHA (SEQ ID NO: 31) of Lactobacillus delbrueckii or a polynucleotide encoding a polypeptide of *Lactobacillus plantarum* (SEQ ID NO: 32).

14. A method for producing D-lactic acid, comprising:

(a) culturing the modified D-lactic acid-producing strain of any one of claims 1 to 10, to obtain a culture broth; and

(b) recovering D-lactic acid from the culture broth.

WHAT IS CLAIMED IS:

1. A D-lactic acid-producing strain modified to attenuate or inactivate L-lactate dehydrogenase (L-LDH) activity and to enhance D-lactate dehydrogenase (D-LDH) activity.

2. The strain according to claim 1, wherein an L-LDH-encoding polynucleotide is inactivated.

3. The strain according to claim 2, wherein the L-LDH-encoding polynucleotide is selected from the group consisting of *ldh* (SEQ ID NO: 25) and *ldh1* (SEQ ID NO: 26)of Lactobacillus paracasei, *ldh1* (SEQ ID NO: 27) and *ldh2* (SEQ ID NO: 28)of Lactobacillus paracasei, *ldh*(*LGG_02523*) (SEQ ID NO: 29) and *ldh* (*LGG_00606*)(SEQ ID NO: 30)of Lactobacillus rhamnosus.

4. The strain according to claim 1, wherein a D-LDH-encoding polynucleotide is introduced.

5. The strain according to claim 4, wherein the D-LDH-encoding polynucleotide is derived from *Lactobacillus plantarum* or *Lactobacillus delbrueckii*.

6. The strain according to claim 5, wherein the D-LDH-encoding polynucleotide is a LDHA (SEQ ID NO: 31)-encoding polynucleotide of Lactobacillus delbrueckii or a LDHD (SEQ ID NO: 32)-encoding polynucleotide of Lactobacillus plantarum.

7. The strain according to claim 1, wherein one or more of heterogenous D-LDH-encoding polynucleotides are substituted for the L-LDH-encoding polynucleotide in the chromosome and are overexpressed.

8. The strain according to claim 1, wherein the strain before modification is a strain producing L- lactic acid.

9. The strain according to claim 8, wherein the strain is a *Lactobacillus sp* strain.

10. The strain according to claim 8, wherein a polynucleotide encoding LDH1 (SEQ ID NO: 27) and a polynucleotide encoding LDH2 (SEQ ID NO: 28) of *Lactobacillus casei* are substituted with a polynucleotide encoding LDHA (SEQ ID NO: 31) of *Lactobacillus delbrueckii* and a polynucleotide encoding LDHD (SEQ ID NO: 32) of *Lactobacillus plantarum*, respectively.

11. The strain according to claim 8, wherein a polynucleotide encoding LDH (SEQ ID NO: 25) and a polynucleotide encoding LDH1 (SEQ ID NO: 26) of *Lactobacillus paracasei* are substituted with a polynucleotide encoding LDHA (SEQ ID NO: 31) of *Lactobacillus delbrueckii* and a polynucleotide encoding LDHD (SEQ ID NO: 32) of *Lactobacillus plantarum*, respectively.

12. The strain according to claim 8, wherein a polynucleotide encoding LDH(LGG_02523) (SEQ ID NO: 29) and a polynucleotide encoding LDH(LGG_00606) (SEQ ID NO: 30) of *Lactobacillus rhamnosus* are substituted with a polynucleotide encoding LDHA (SEQ ID NO: 31) of *Lactobacillus delbrueckii* and a polynucleotide encoding LDHD (SEQ ID NO: 32) of *Lactobacillus plantarum*, respectively.

13. The strain according to claim 12, wherein it is *Lactobacillus paracasei* CC02-0095 deposieted under the Accession No. KCCM11273P.

14. A method for preparing a modified D-lactic acid-producing strain, comprising:

(a) attenuating or inactivating L-lactate dehydrogenase (L-LDH) activity in an L-lactic acid-producing strain to obtain a modified lactic acid-producing strain; and

(b) introducing or enhancing D-lactate dehydrogenase (D-LDH) activity in the modified lactic acid-producing strain.

15. The method according to claim 14, wherein the L-lactic acid-producing strain is a *Lactobacillus sp.* strain.

16. The method according to claim 14, wherein the L-lactic acid-producing strain is selected from the group consisting of *Lactobacillus brevis*, *Lactobacillus pentosus*, *Lactobacillus rhamnosus*, *Lactobacillus jensenii*, *Lactobacillus plantarum*, *Lactobacillus paraplantarum*, *Lactobacillus fermentum*, *Lactobacillus paracasei*, *Lactobacillus acidophilus*, *Lactobacillus johnsonii*, and *Lactobacillus casei*.

17. The method according to claim 14, wherein the L-LDH activity is attenuated or inactivated by substitution, deletion, insertion or addition of an L-LDH-encoding polynucleotide.

18. The method according to claim 17, wherein the L-LDH-encoding polynucleotide is selected from the group consisting of *ldh* (SEQ ID NO: 25) and *ldh1* (SEQ ID NO: 26) of Lactobacillus paracasei, *ldh1* (SEQ ID NO: 27) and *ldh2* (SEQ ID NO: 28) of Lactobacillus casei, *ldh(LGG_02523)* (SEQ ID NO: 29) and *ldh(LGG_00606)* (SEQ ID NO: 30) of Lactobacillus rhamnosus.

19. The method according to claim 14, wherein the D-LDH activity is introduced or enhanced by introducing a D-LDH-encoding polynucleotide into the chromosome of the modified lactic acid-producing strain.

20. The method according to claim 14, wherein the D-LDH activity is introduced or enhanced by introducing an expression vector including a D-LDH-encoding polynucleotide into the modified lactic acid-producing strain.

21. The method according to claim 19 or 20, wherein the D-LDH-encoding polynucleotide is a polynucleotide encoding LDHA (SEQ ID NO: 31) of Lactobacillus delbrueckii or a polynucleotide encoding a polypeptide of *Lactobacillus plantarum* (SEQ ID NO: 32).

22. A method for producing D-lactic acid, comprising:

(a) culturing the modified D-lactic acid-producing strain of any one of claims 1 to 13 to obtain a culture broth; and

(b) recovering D-lactic acid from the culture broth.

23. The method according to claim 22, wherein the modified D-lactic acid-producing strain is *Lactobacillus paracasei* CC02-0095deposieted under the KCCM11273P.

24. The method according to claim 22, wherein the D-lactic acid is recoverd by a method selected from the group consisting of centrifugation, filtration, extraction, spraying, drying, evaporation, precipitation, crystallization, electrophoresis, fractional dissolution, chromatography and combinations thereof.