CLAIMS

1. A nucleic acid consisting of a nucleotide sequence selected from the group consisting of:

(a) SEQ ID NOs: 1-3, 7-12, 16-18, and 28-45 to detect *Lactobacillus*;
(b) SEQ ID NOs: 13-15 to detect *Pectinatus*;
(c) SEQ ID NOs: 19-21 to detect *Megasphaera*; and
(d) SEQ ID NOs: 22-27 to detect *Pediococcus*.

2. A collection of nucleic acids comprising two or more nucleic acids, wherein the two or more nucleic acids each consist of a nucleotide sequence selected from the group consisting of:

(a) SEQ ID NOs: 1-3, 7-12, 16-18, and 28-45 to detect *Lactobacillus*;
(b) SEQ ID NOs: 13-15 to detect *Pectinatus*;
(c) SEQ ID NOs: 19-21 to detect *Megasphaera*; and
(d) SEQ ID NOs: 22-27 to detect *Pediococcus*.

3. The collection according to claim 2, wherein the two or more nucleic acids include two or more different nucleic acids.

4. An assay kit comprising a collection of nucleic acids, wherein the collection is selected from the group consisting of:

(a) SEQ ID NOs: 1-3 to detect *Lactobacillus*;
(b) SEQ ID NOs: 7-9 to detect *Lactobacillus*;
(c) SEQ ID NOs: 10-12 to detect *Lactobacillus*;
(d) SEQ ID NOs: 13-15 to detect *Pectinatus*;
(e) SEQ ID NOs: 16-18 to detect *Lactobacillus*;
(f) SEQ ID NOs: 19-21 to detect *Megasphaera*;
(g) SEQ ID NOs: 22, 24, and 27 to detect *Pediococcus*;
(h) SEQ ID NOs: 22, 25, and 27 to detect *Pediococcus*;
(i) SEQ ID NOs: 23, 26, and 27 to detect *Pediococcus*;
(j) SEQ ID NOs: 28-30 to detect *Lactobacillus*;
(k) SEQ ID NOs: 31-33 to detect *Lactobacillus*;
(l) SEQ ID NOs: 34-36 to detect *Lactobacillus*;

(m) SEQ ID NOs: 37-39 to detect *Lactobacillus*;
(n) SEQ ID NOs: 40-42 to detect *Lactobacillus*; and
(o) SEQ ID NOs: 43-45 to detect *Lactobacillus*.

5. A support comprising the nucleic acid according to claim 1, the collection of nucleic acids according to any one of claims 2-3, or the collection of nucleic acids of the assay kit of claim 4 immobilized on the support.

6. The support according to claim 5, further comprising a detectable label.

7. A method of detecting the presence of one or more microorganisms in a foodstuff, the method comprising:

(a) obtaining at least one test sample comprising isolated microorganism nucleic acid from foodstuff;

(b) contacting the nucleic acid according to claim 1, the collection of nucleic acids according to any one of claims 2-3, the collection of nucleic acids of the assay kit according to claim 4, or the support including the nucleic acid according to claim 5 or 6 with the at least one test sample under conditions allowing for a complex to form between the nucleic acid and the microorganism nucleic acid;

(c) detecting the complex; and, optionally,

(d) comparing an amount of complex in the at least one test sample with an amount of complex from a negative sample that lacks microorganism nucleic acid,

wherein an increased amount of complex from the at least one test sample is indicative of the presence of one or more microorganisms, and

wherein (i) the nucleotide sequences of each of SEQ ID NOs: 1-3, 7-12, 16-18, and 28-45 specifically forms a complex with *Lactobacillus* nucleic acid;

(ii) the nucleotide sequences of each of SEQ ID NOs: 13-15 specifically forms a complex with *Pectinatus* nucleic acid;

(iii) the nucleotide sequences of each of SEQ ID NOs: 19-21 specifically forms a complex with *Megasphaera* nucleic acid; and

(iv) the nucleotide sequences of each of SEQ ID NOs: 22-27 specifically forms a complex with *Pediococcus* nucleic acid.

8. The method according to claim 7, comprising detecting the presence of one or more microorganisms that causes spoilage of foodstuff.

9. The method according to claim 7 or 8, comprising detecting the presence of one or more microorganisms of one or more genera selected from the group consisting of *Pediococcus, Lactobacillus, Pectinatus,* and *Megasphaera.*

10. The method according to any one of claims 7-9, comprising detecting the presence of one or more microorganisms selected from the group consisting of *Pediococcus damnosus, Pediococcus inopinatus, Pediococcus claussenii, Lactobacillus backii, Lactobacillus brevis, Lactobacillus casei, Lactobacillus coryniformis, Lactobacillus collinoides, Lactobacillus lindneri, Lactobacillus rossiae, Lactobacillus parabuchneri, Lactobacillus paracollinoides, Lactobacillus perolens, Lactobacillus plantarum, Pectinatus cerevisiiphillus, Pectinatus frisingensis, Pectinatus haikarae, Pectinatus portalensis, Megasphaera cerevisiae,* and *Megasphaera elsdenii.*

11. The method according to any one of claims 7-10, wherein the foodstuff is a beverage.

12. The method according to any one of claims 7-11, wherein the foodstuff is beer.

13. The collection of nucleic acids according to claim 2 or 3, wherein the two or more nucleic acids comprise a first nucleic acid consisting of the nucleotide sequence of SEQ ID NO: 28, a second nucleic acid consisting of the nucleotide sequence of SEQ ID NO: 29, and the third nucleic acid consisting of the nucleotide sequence of SEQ ID NO: 30.

14. The collection of nucleic acids according to claim 13, further comprising one or more nucleic acids, each consisting of a nucleotide sequence selected from the group consisting of SEQ ID NOs: 1-3, 7-27, and 31-45.

15. The assay kit according to claim 4, comprising a collection of nucleic acids, wherein the collection comprises a first nucleic acid consisting of the nucleotide sequence of SEQ ID NO: 28, a second nucleic acid consisting of the nucleotide sequence of SEQ ID NO: 29, and the third nucleic acid consisting of the nucleotide sequence of SEQ ID NO: 30.

16. The assay kit according to claim 15, further comprising a collection selected from the group consisting of:

(a) SEQ ID NOs: 1-3;
(b) SEQ ID NOs: 7-9;
(c) SEQ ID NOs: 10-12;
(d) SEQ ID NOs: 13-15;
(e) SEQ ID NOs: 16-18;
(f) SEQ ID NOs: 19-21;
(g) SEQ ID NOs: 22, 24, and 27;
(h) SEQ ID NOs: 22, 25, and 27;
(i) SEQ ID NOs: 23, 26, and 27;
(j) SEQ ID NOs: 31-33;
(k) SEQ ID NOs: 34-36;
(l) SEQ ID NOs: 37-39;
(m) SEQ ID NOs: 40-42; and
(n) SEQ ID NOs: 43-45.

17. The support according to claim 5, wherein the collection of nucleic acids comprises a first nucleic acid consisting of the nucleotide sequence of SEQ ID NO: 28, a second nucleic acid consisting of the nucleotide sequence of SEQ ID NO: 29, and the third nucleic acid consisting of the nucleotide sequence of SEQ ID NO: 30.

18. The support according to claim 17, wherein the collection of nucleic acids further comprises at least one nucleotide sequence selected from the group consisting of SEQ ID NOs: 1-3, 7-27, and 31-45.

19. The method according to any one of claims 7-12, comprising contacting the collection of nucleic acids according to claim 13 or 14, the collection of nucleic acids of the assay kit according to claim 15 or 16, or the support according to claim 17 or 18 with the at least one test sample under conditions allowing for a complex to form between the nucleic acid and the microorganism nucleic acid.

CLAIMS

1. A collection of nucleic acids comprising:

(a) SEQ ID NOs: 1-3 to detect one or both of *Lactobacillus collinoides* and *Lactobacillus paracollinoides*;

(b) SEQ ID NOs: 7-9 to detect *Lactobacillus backii*;

(c) SEQ ID NOs: 10-12 to detect *Lactobacillus brevis;*

(d) SEQ ID NOs: 13-15 to detect one or more of *Pectinatus cerevisiiphilus, Pectinatus frisingensis, Pectinatus haikarae* and *Pectinatus portalensis*;

(e) SEQ ID NOs: 16-18 to detect *Lactobacillus lindneri;*

(f) SEQ ID NOs: 19-21 to detect one or both of *Megasphaera cerevisiae* and *Megasphaera elsdenii*;

(g) (1) SEQ ID NO: 22 or 23, (2) SEQ ID NO: 24, 25, or 26, and (3) SEQ ID NO: 27 to detect one or more of *Pediococcus damnosus, Pediococcus inopinatus,* and *Pediococcus claussenii;*

(h) SEQ ID NOs: 28-30 to detect *Lactobacillus casei;*

(i) SEQ ID NOs: 31-33 to detect *Lactobacillus coryniformis;*

(j) SEQ ID NOs: 34-36 to detect *Lactobacillus parabuchneri;*

(k) SEQ ID NOs: 37-39 to detect *Lactobacillus perolens;*

(l) SEQ ID NOs: 40-42 to detect *Lactobacillus plantarum;* and

(m) SEQ ID NOs: 43-45 to detect *Lactobacillus rossiae.*

2. An assay kit comprising the collection of nucleic acids according to claim 1.

3. A support comprising the collection of nucleic acids according to claim 1 or the collection of nucleic acids of the assay kit of claim 2 immobilized on the support.

4. The support according to claim 3, further comprising a detectable label.

5. A method of detecting the presence of one or more microorganisms in a foodstuff, the method comprising:

(a) obtaining at least one test sample comprising isolated microorganism nucleic acid from foodstuff;

(b) contacting the the collection of nucleic acids according to claim 1, the collection of nucleic acids of the assay kit according to claim 2, or the support according to claim 3 or 4 with the at least one test sample under conditions allowing for a complex to form between the nucleic acid and the microorganism nucleic acid;

(c) detecting the complex; and, optionally,

(d) comparing an amount of complex in the at least one test sample with an amount of complex from a negative sample that lacks microorganism nucleic acid,

wherein an increased amount of complex from the at least one test sample is indicative of the presence of one or more microorganisms, and

wherein (i) the nucleotide sequences of each of SEQ ID NOs: 1-3 specifically forms a complex with one or both of *Lactobacillus collinoides* nucleic acid and *Lactobacillus paracollinoides* nucleic acid;

(ii) the nucleotide sequences of each of SEQ ID NOs: 7-9 specifically forms a complex with *Lactobacillus backii* nucleic acid;

(iii) the nucleotide sequences of each of SEQ ID NOs: 10-12 specifically forms a complex with *Lactobacillus brevis* nucleic acid;

(iv) the nucleotide sequences of each of SEQ ID NOs: 13-15 specifically forms a complex with one or more of *Pectinatus cerevisiiphilus* nucleic acid, *Pectinatus frisingensis* nucleic acid, *Pectinatus haikarae* nucleic acid and *Pectinatus portalensis* nucleic acid;

(v) the nucleotide sequences of each of SEQ ID NOs: 16-18 specifically forms a complex with *Lactobacillus lindneri* nucleic acid;

(vi) the nucleotide sequences of each of SEQ ID NOs: 19-21 specifically forms a complex with one or both of *Megasphaera cerevisiae* nucleic acid and *Megasphaera elsdenii* nucleic acid;

(vii) the nucleotide sequences of each of (1) SEQ ID NO: 22 or 23, (2) SEQ ID NO: 24, 25, or 26, and (3) SEQ ID NO: 27 specifically forms a complex with one or more of *Pediococcus*

damnosus nucleic acid, *Pediococcus inopinatus* nucleic acid, and *Pediococcus claussenii* nucleic acid;

(viii) the nucleotide sequences of each of SEQ ID NOs: 28-30 specifically forms a complex with *Lactobacillus casei* nucleic acid;

(ix) the nucleotide sequences of each of SEQ ID NOs: 31-33 specifically forms a complex with *Lactobacillus coryniformis* nucleic acid;

(x) the nucleotide sequences of each of SEQ ID NOs: 34-36 specifically forms a complex with *Lactobacillus parabuchneri* nucleic acid;

(xi) the nucleotide sequences of each of SEQ ID NOs: 37-39 specifically forms a complex with *Lactobacillus perolens* nucleic acid;

(xii) the nucleotide sequences of each of SEQ ID NOs: 40-42 specifically forms a complex with *Lactobacillus plantarum* nucleic acid; and

(xiii) the nucleotide sequences of each of SEQ ID NOs: 43-45 specifically forms a complex with *Lactobacillus rossiae* nucleic acid.

6. The method according to claim 5, wherein the foodstuff is a beverage.

7. The method according to claim 5 or 6, wherein the foodstuff is beer.