Summary ~~of the invention~~

Thus, an object of the present ~~invention~~disclosure relates to new lactic acid bacteria as well as compositions, topical compositions, vaginal compositions, eye compositions, ear compositions or oral compositions comprising said new lactic acid bacteria, and their ability to prevent or treat candidiasis and Candida infections.

In particular, it is an object of the present ~~invention~~disclosure to provide a new lactic acid bacterial strain and compositions comprising this new lactic acid bacterial strain that solves the above-mentioned problems of the prior art with biofilm formation, in particular biofilm formation of Candida pathogens, and thereby prevent infection.

Thus, ~~one aspect of~~ the ~~invention~~disclosure relates to a composition comprising *Pediococcus pentosaceus* LB606R, deposited under the assession number DSM 33730; *Lactiplantibacillus plantarum*, LB679R, deposited under the assession number DSM 33731; or a combination hereof.

In one aspect, the present disclosure relates to a composition comprising *Pediococcus pentosaceus* LB606R, deposited under the assession number DSM 33730.

~~Another aspect of the~~The present ~~invention~~disclosure also relates to an isolated bacterial strain selected from *Pediococcus pentosaceus LB606R,* deposited under the deposit assession number DSM 33730; and/or one or more bacteria strain selected from *Lactiplantibacillus plantarum* LB 679R, deposited under the deposit assession number DSM 33731.

In another aspect, the present disclosure relates to an isolated bacterial strain selected from *Pediococcus pentosaceus LB606R,* deposited under the deposit assession number DSM 33730.

~~Yet another aspect of the~~The present ~~invention~~disclosure also relates to a composition comprising one or more bacterial strains selected from one or more *Pediococcus* strains; and/or one or more bacteria strains selected from one or more *Lactiplantibacillus* strains for use as a medicament.

In another aspect, the present disclosure relates to a composition comprising one or more *Pediococcus* strains.

~~Still another aspect of the~~The present ~~invention~~disclosure also relates to a composition comprising one or more bacterial strains selected from one or more *Pediococcus* strains; and/or one or more bacteria strains selected from one or more *Lactiplantibacillus* strains for use in the prevention and/or treatment of candidiasis in a human or in an animal.

In another aspect, the present disclosure relates to a composition comprising one or more bacterial strains selected from one or more *Pediococcus* strains for use in the prevention and/or treatment of candidiasis in a human or in an animal.

In another aspect, the present disclosure relates to use of a composition comprising one or more bacterial strains selected from one or more *Pediococcus* strains in the manufacture of a medicament for the prevention and/or treatment of candidiasis in a human or in an animal.

~~A further aspect of the~~The present ~~invention~~disclosure also relates to a composition comprising one or more bacterial strains selected from one or more *Pediococcus* strains; and/or one or more bacteria strains selected from one or more *Lactiplantibacillus* strains for use in the prevention, inhibition, or treatment of biofilm formation.

In another aspect, the present disclosure relates to a composition comprising one or more bacterial strains selected from one or more *Pediococcus* strains for use in the prevention, inhibition, or treatment of biofilm formation.

In another aspect, the present disclosure relates to use of a composition comprising one or more bacterial strains selected from one or more *Pediococcus* strains in the manufacture of a medicament for the prevention, inhibition, or treatment of biofilm formation.

~~An even further aspect of the~~The present ~~invention~~disclosure also relates to a method for preventing biofilm formation in an environment, wherein the biofilm comprises candida species comprising

the steps of: administering to the environment an effective amount of a lactic acid bacteria with antimicrobial activity, wherein the environment is a home, workplace, laboratory, industrial environment, hospital environment, aquatic environment, medical device, dental device, epithelial cells, mucous membranes, an animal or a human body.

In another aspect, the present disclosure relates to a method for preventing biofilm formation in an environment, wherein the biofilm comprises candida species comprising the steps of: administering to the environment an effective amount of a lactic acid bacteria with antimicrobial activity, wherein the environment is a home, workplace, laboratory, industrial environment, aquatic environment, medical device, dental device, epithelial cells or mucous membranes.

~~A further aspect of the~~The present ~~invention~~disclosure also relates to a food or feed ingredient, and a personal hygiene product, comprising the composition ~~according to claims 1-6~~as described herein.

Brief description of the figures

Figure 1 shows the Co-aggregation of C. albicans strain L26 and LB606R. The control of C. albicans L26 (Fig. 1a) shown with the combination and co-aggregation with LB606R (Fig. 1b), and

Figure 2 shows Growth inhibition by CFS of LB606R (Fig. 2a) and LB679R (Fig. 2b) against growth of C. albicans strain L26 at various concentrations of LB606R (Fig.2a) and LB679R (Fig. 2b).

The present invention will now be described in more detail in the following.

Detailed description of the invention

Accordingly, the inventors of the present invention found particular lactic acid bacteria having antimicrobial activity targeted towards *Candida albicans*.

It is believed that the lactic acid bacteria of the present invention are able to colonize mucous membranes and/or prevent biofilm formation by pathogenic Candida spp. and/or have antimicrobial activity against pathogenic Candida spp. In particular *Candida albicans*.

The Lactic acid bacteria may be selected from a Pediococcus strain and/or a Lactiplantibacillus strain. preferably the lactic acid bacteria may be selected from the group consisting of *Pediococcus pentosaceus* LB606R deposited on 14th of December 2020 with DSMZ German Collection of Microorganisms and Cell Cultures GmbH as DSM 33730 and *Lactiplantibacillus plantarum* deposited as DSM 33731.

The Lactic acid bacteria selected from a Pediococcus strain (preferably the lactic acid bacteria selected from Pediococcus pentosaceus LB606R deposited on 14th of December

Claims

1. A composition comprising *Pediococcus pentosaceus* LB606R, deposited under the assession number DSM 33730~~; *Lactiplantibacillus plantarum*, LB679R, deposited under the assession number DSM 33731; or a combination hereof~~.

2. The composition according to claim 1, wherein the composition inhibits biofilm formation.

3. The composition according to anyone of the preceding claims, wherein the composition is formulated for oral use, topical use, anal use or genital use.

4. The composition according to anyone of the preceding claims, wherein the composition further comprises one or more prebiotic.

5. The composition according to anyone of the preceding claims, wherein the ~~the one or more *Pediococcus* strains (such as~~ *Pediococcus pentosaceus LB606R,* deposited under the deposit assession number DSM 33730~~); and/or the one or more *Lactiplantibacillus* strains, (such as *Lactiplantibacillus plantarum* LB 679R, deposited under the deposit assession number DSM 33731) may be~~ is provided as viable cells, as non-viable cells, as a lysate, or as a supernatant.

6. The composition according to anyone of the preceding claims, wherein the *Pediococcus pentosaceus LB606R,* deposited under the deposit assession number DSM 33730 may be stabilized in freeze dried, lyophilized or microencapsulated forms.

~~6~~7. The composition according to claim 5, wherein the non-viable cells are provided as a lysate, as a fraction, as a ferment, as metabolites, as an extract, as a derivative, as analogues, or as a mutant of one of the *Pediococcus* strains~~ or the *Lactiplantibacillus*~~.

~~7~~8. The composition according to ~~claim 5~~any one of claims 5 or 7, wherein the lysate includes the cell wall or cell wall constituents including binding receptors.

9. The composition according to anyone of the preceding claims, wherein the *Pediococcus pentosaceus LB606R,* deposited under the deposit assession number DSM 33730 is an isolated *Pediococcus pentosaceus LB606R,* deposited under the deposit assession number DSM 33730.

~~8~~10. An isolated bacterial strain selected from *Pediococcus pentosaceus LB606R,* deposited under the deposit assession number DSM 33730~~; and/or one or more bacteria strain selected from *Lactiplantibacillus plantarum* LB 679R, deposited under the deposit assession number DSM 33731~~.

~~9~~11. A composition comprising one or more ~~bacterial strains selected from one or more~~ *Pediococcus* strains~~; and/or one or more bacteria strains selected from one or more *Lactiplantibacillus* strains for use as a medicament~~.

~~10~~12. A composition comprising one or more bacterial strains selected from one or more *Pediococcus* strains~~; and/or one or more bacteria strains selected from one or more *Lactiplantibacillus* strains~~ for use in the prevention and/or treatment of candidiasis in a human or in an animal.

~~11~~13. A composition comprising one or more bacterial strains selected from one or more *Pediococcus* strains~~; and/or one or more bacteria strains selected from one or more *Lactiplantibacillus* strains~~ for use in the prevention, inhibition, or treatment of biofilm formation.

~~12~~14. The composition for use according to claim ~~11~~13, wherein the biofilm formation may be a yeast biofilm formation, such as a pathogenic *Candida* species biofilm formation; in particular a *Candida albicans* biofilm formation.

15. Use of a composition comprising one or more bacterial strains selected from one or more *Pediococcus* strains in the manufacture of a medicament for the prevention and/or treatment of candidiasis in a human or in an animal.

16. Use of a composition comprising one or more bacterial strains selected from one or more *Pediococcus* strains in the manufacture of a medicament for the prevention, inhibition, or treatment of biofilm formation.

17. The use according to claim 16, wherein the biofilm formation may be a yeast biofilm formation, such as a pathogenic *Candida* species biofilm formation; in particular a *Candida albicans* biofilm formation.

~~13~~18. A method for preventing biofilm formation in an environment, wherein the biofilm comprises candida species comprising the steps of: administering to the environment an effective amount of a lactic acid bacteria with antimicrobial activity, wherein the environment is a home, workplace, laboratory, industrial environment, aquatic

environment, medical device, dental device, epithelial cells~~,~~ or mucous membranes~~, human or animal body~~.