

Antagonistic activity of *Lactiplantibacillus plantarum* against *Aliarcobacter butzleri*

Alexandre Vieira¹, Cristiana Mateus¹, Fernanda Domingues¹, Mónica Oleastro², Susana Ferreira^{1*}

¹ CICS-UBI – Health Sciences Research Centre, University of Beira Interior, Covilhã, Portugal.

² National Reference Laboratory for Gastrointestinal Infections, Department of Infectious Diseases, National Institute of Health Dr. Ricardo Jorge, Lisbon, Portugal.

* susana.ferreira@fcsaude.ubi.pt

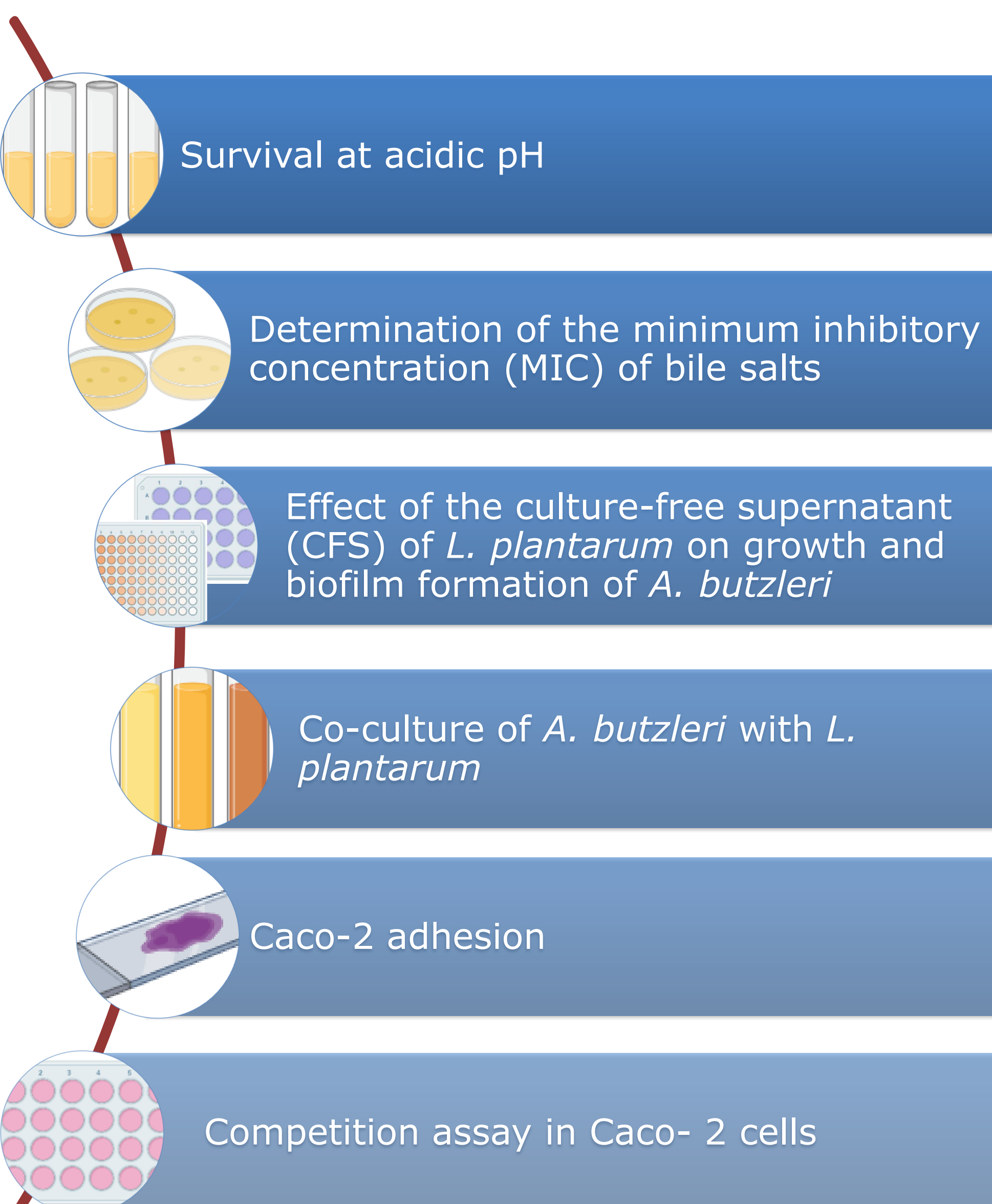
Introduction

- *Aliarcobacter butzleri* is an emergent enteropathogen, which to establish gastrointestinal infections, must be able to tolerate various adverse conditions, including the inhibition by probiotics, such as *Lactiplantibacillus plantarum*^[1,2].
- *L. plantarum* is a non-gas-producing lactic acid bacterium that is regarded as safe and have over the years gained increasing significance as a probiotic^[3,4].

Aim

The aim of this study was to explore the potential activity of *L. plantarum* ATCC 8014 against *A. butzleri*.

Methodology



Conclusion

- To sum up, *Aliarcobacter butzleri*'s virulence may be enhanced by *Lactiplantibacillus plantarum*.

References

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- [2] S. Ferreira, M. Oleastro, and F. Domingues. 2019 'Current insights on Arcobacter butzleri in food chain'. *Current Opinion in Food Science*, 26, 9-17. doi: 10.1016/j.cofs.2019.02.013.
- [3] Y. W. Liu, M. T. Liong, and Y. C. Tsai. 2018 'New perspectives of Lactobacillus plantarum as a probiotic: The gut-heart-brain axis'. *J Microbiol*, 56(9), 601-613. doi: 10.1007/s12275-018-8079-2.
- [4] H. A. Seddik, F. Bendali, F. Gancel, I. Fliss, G. Spano, and D. Drider. 2017 'Lactobacillus plantarum and Its Probiotic and Food Potentialities'. *Probiotics Antimicrob Proteins*, 9(2), 111-122. doi: 10.1007/s12602-017-9264-z.

Results

- **Survival at acidic pH and minimum inhibitory concentration of bile salts**

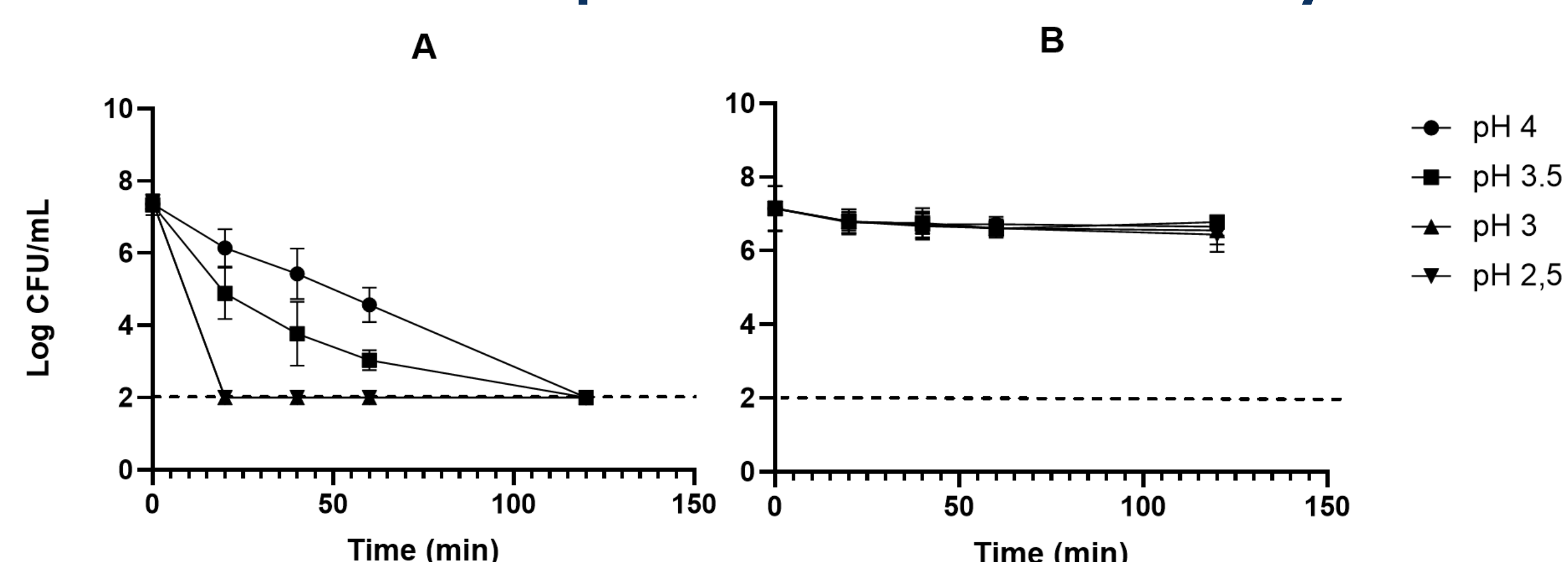


Figure 1. Survival of *Aliarcobacter butzleri* Ab_2811 strain (A) and *Lactiplantibacillus plantarum* ATCC 8014 (B) at acidic pH.

A. butzleri was more susceptible to acidic pH than *L. plantarum*, which was able to survive to the tested pH range.

The MIC of bile salts against *L. plantarum* was 0.6%, while against *A. butzleri* was less susceptible with a MIC of 5%.

- **The effect of the CFS from *L. plantarum* on growth and biofilm formation of *A. butzleri***

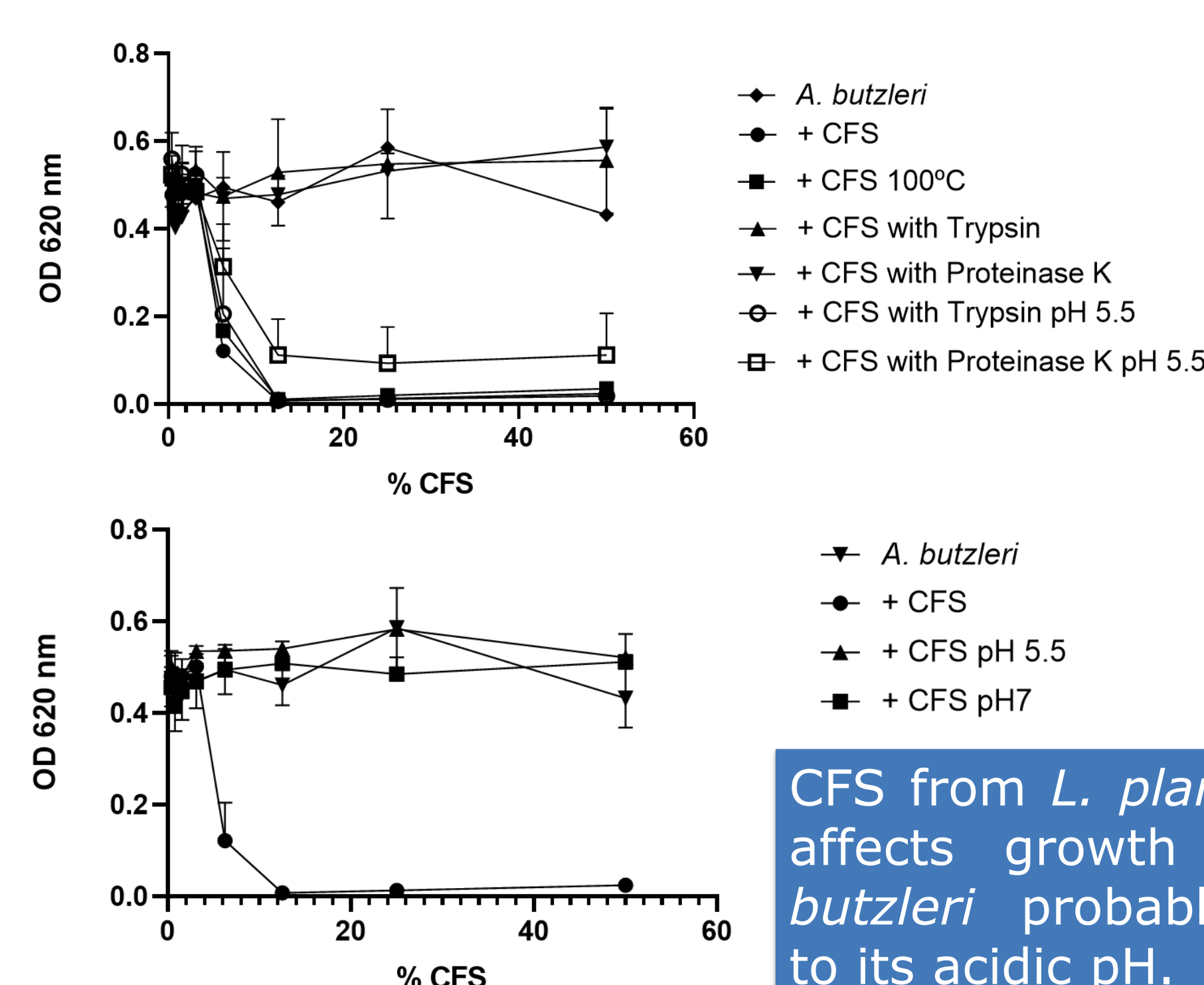


Figure 2. Effect of the culture-free supernatant (CFS) of *Lactiplantibacillus plantarum* with different conditions on the growth of *Aliarcobacter butzleri*.

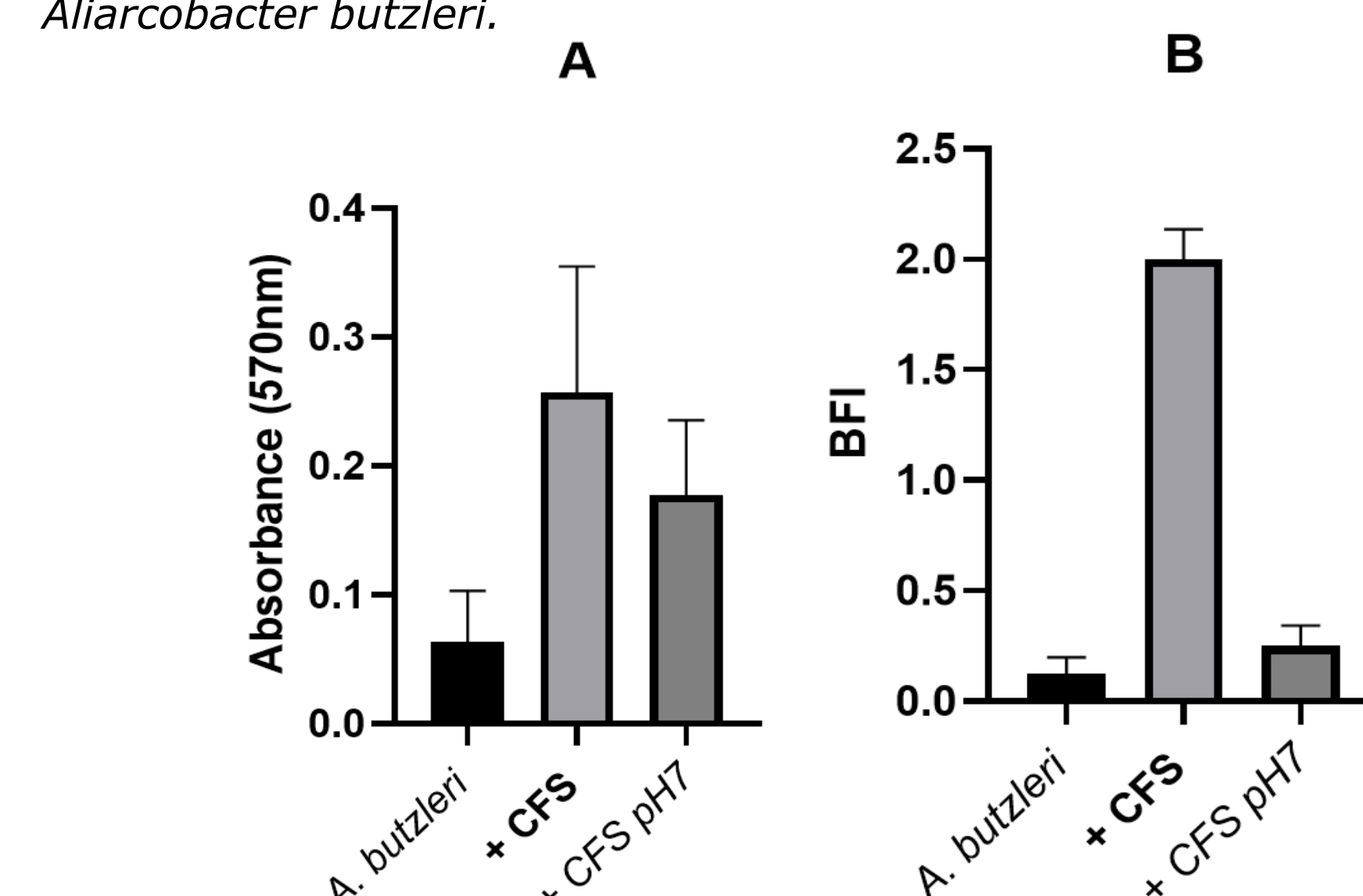


Figure 3. Effect of the CFS of *Lactiplantibacillus plantarum* on biofilm formation of *Aliarcobacter butzleri* strain, considering the biofilm formation at 570nm (A) and the biofilm formation index (B).

L. plantarum's CFS is responsible for inhibiting *A. butzleri*'s growth, while can also promote biofilm formation.

- **Co-culture of *A. butzleri* with *L. plantarum***

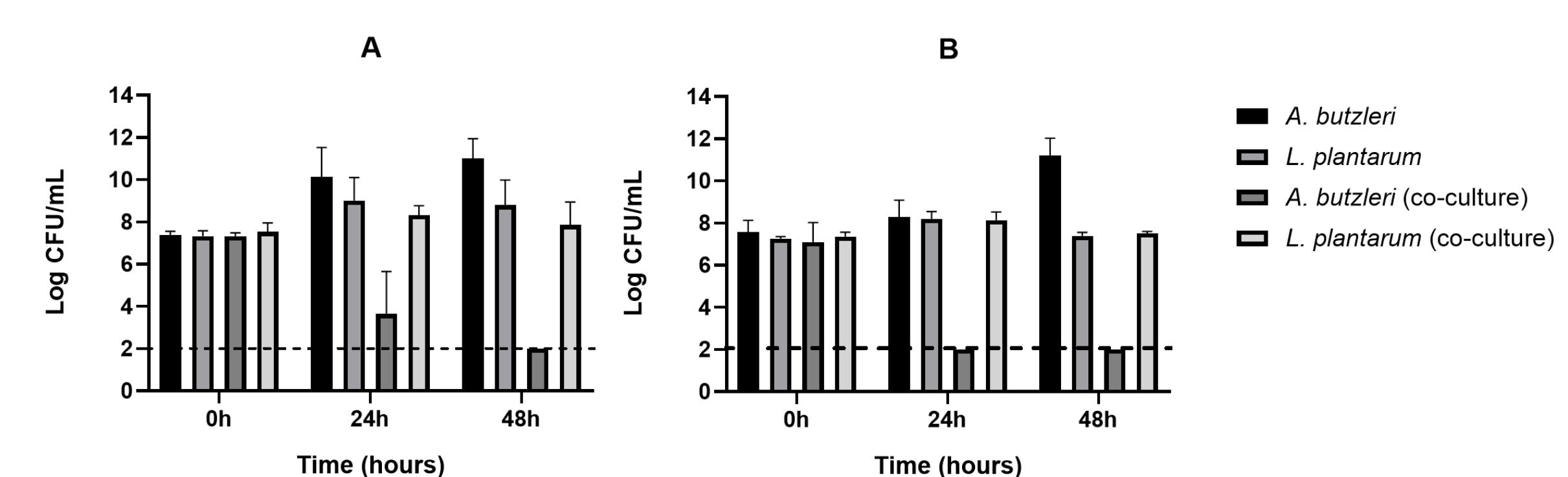


Figure 4. Co-culture of *Aliarcobacter butzleri* in the presence of *Lactiplantibacillus plantarum*, when grown in tryptic soy broth (TSB) (A) or grown in TSB with De Man, Rogosa and Sharpe (MRS) with 1:1 (B).

L. plantarum inhibit *A. butzleri* growth when in co-culture.

- **Effects of *L. plantarum* on *A. butzleri* associated with Caco-2 cells**

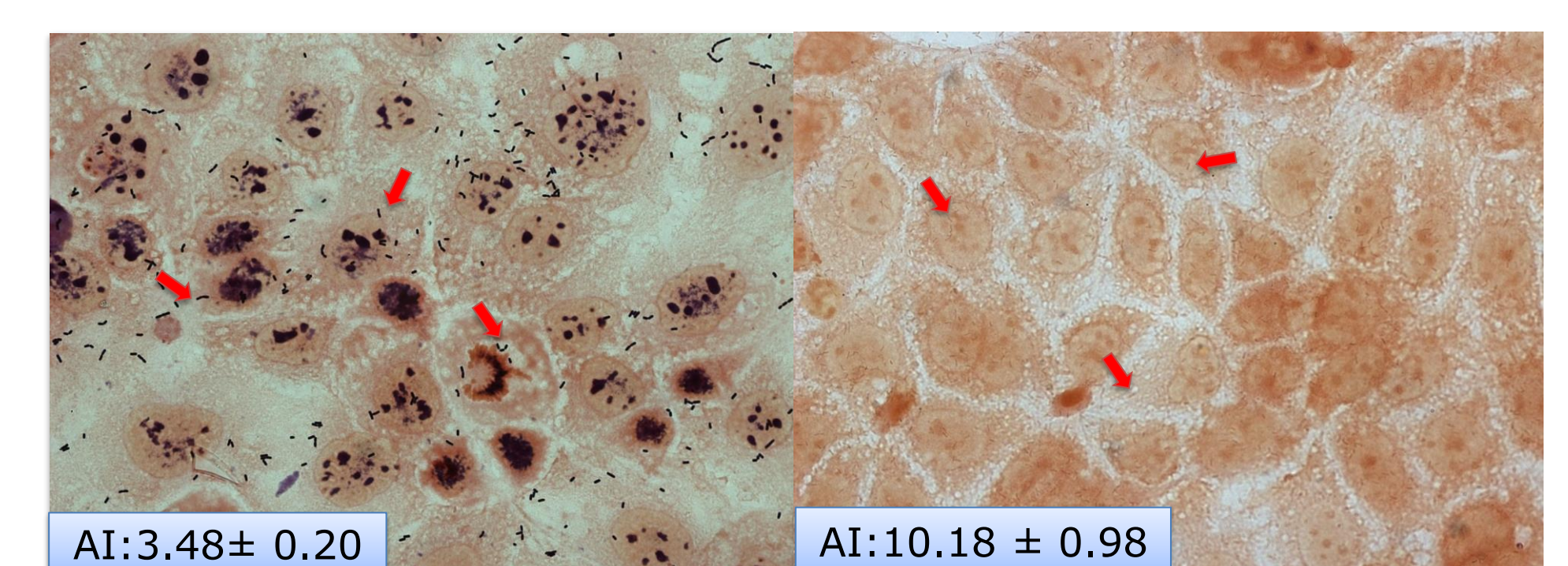


Figure 5. Adhesion index (AI) of *Lactiplantibacillus plantarum* (left) and *Aliarcobacter butzleri* (right) to Caco-2 cells.

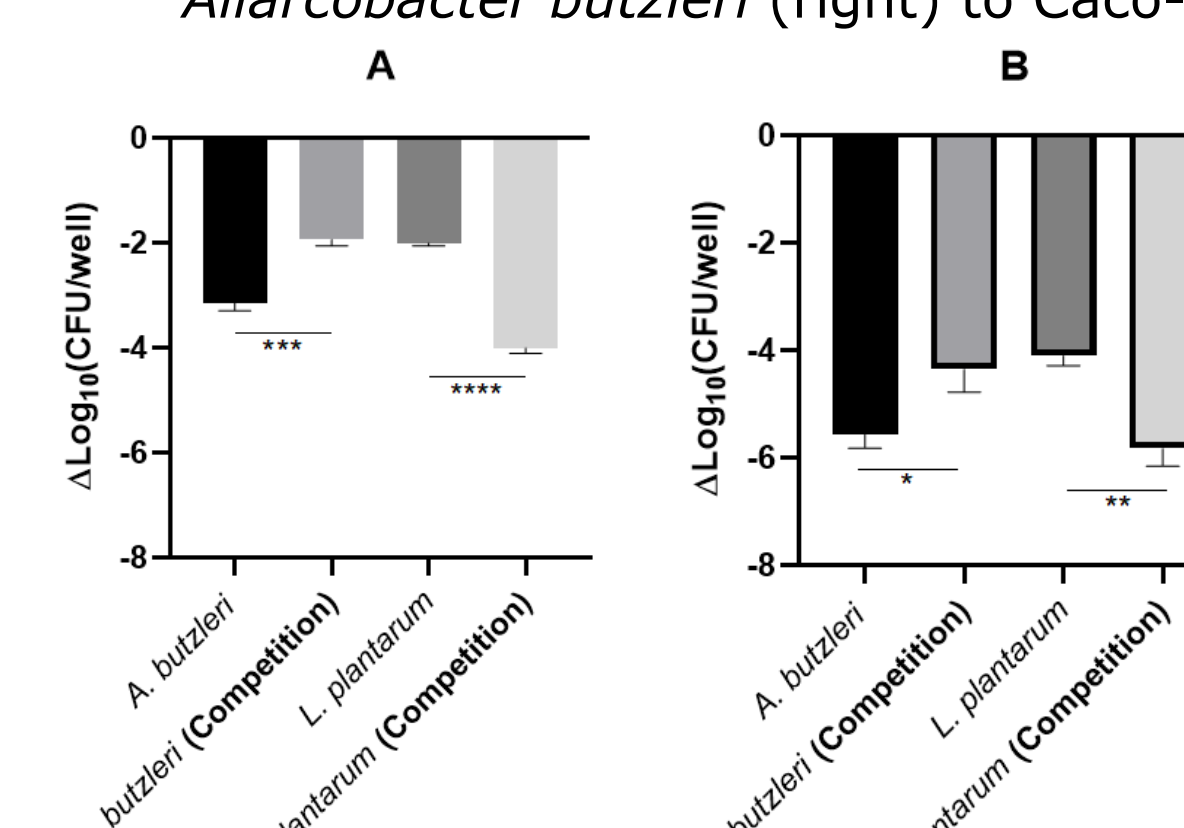


Figure 6. Adhesion(A) and invasion(B) abilities of *Aliarcobacter butzleri* to Caco-2 cells, alone or in competition with *Lactiplantibacillus plantarum*.

A. butzleri strain show a higher adhesion index to Caco-2 cells than *L. plantarum*.

A. butzleri outcompete *L. plantarum* on competition assays, regarding adhesion and invasion to Caco-2 cells.

Acknowledgements

This work was developed within the scope of the CICS-UBI projects UIDB/00709/2020 and UIDP/00709/2020, financed by national funds through the Portuguese Foundation for Science and Technology/MCTES. Cristiana Mateus is recipient of a doctoral fellowship (UI/BD/151023/2021) under the scope of the CICS-UBI Programmatic Funding (UIDP/00709/2020). Susana Ferreira acknowledges UBI and FCT by the contract of Scientific Employment according to DL57/2016.