

Monitoring probiotic lactic acid bacteria strains during sauerkraut production by pulsed-field gel electrophoresis.

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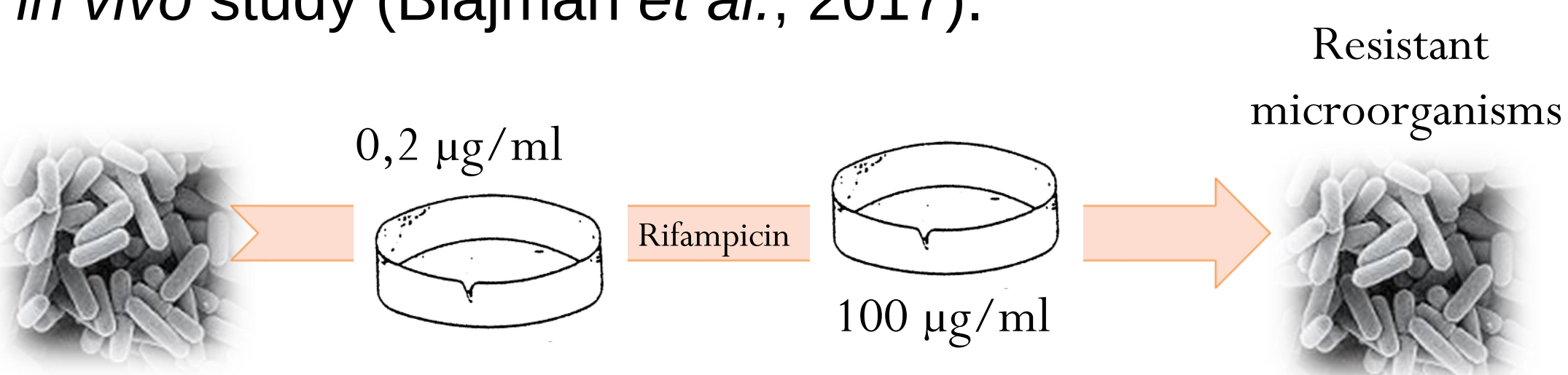
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INTRODUCTION & AIM

The intrinsic health-promoting properties of sauerkraut can be successfully improved by developing effective combinations with probiotics in order to obtain innovative functional products. This study aimed to evaluate the viability and persistence of the commercial probiotic strains *Lactiplantibacillus plantarum* 01 (LP01) and *Lacticaseibacillus rhamnosus* (LR04) when used as adjunct starter cultures during the production of traditional probiotic sauerkraut.

METHOD

Each strain was made resistant to rifampicin (100 µg/mL) in order to track down the inoculum during the *in vivo* study (Blajman *et al.*, 2017).



Shredded cabbage was mixed with 2.0% (w/v) sea salt to create the brine. This mixture was transferred into sterilised glass jars. Control samples underwent spontaneous fermentation, while experimental samples were inoculated with spray-dried powder of either the resistant LP01 or LR04 strain, targeting a concentration of about 1×10^6 cfu/g of sauerkraut. All the samples were incubated at 20°C for 28 days.



The number of lactic acid bacteria (LAB) in the cabbage extracts was counted on MRS agar and on MRS agar plus rifampicin at days 0, 21, and 28. Administered strains were analysed by pulsed-field gel electrophoresis (PFGE) (Gosiewski & Brzychczy-Wloch, 2015).



RESULTS & DISCUSSION

Viable probiotic counts in sauerkraut fermented with strains LP01 or LR04 comprised between **87%** and **99%** of the total LAB (Figure 1).

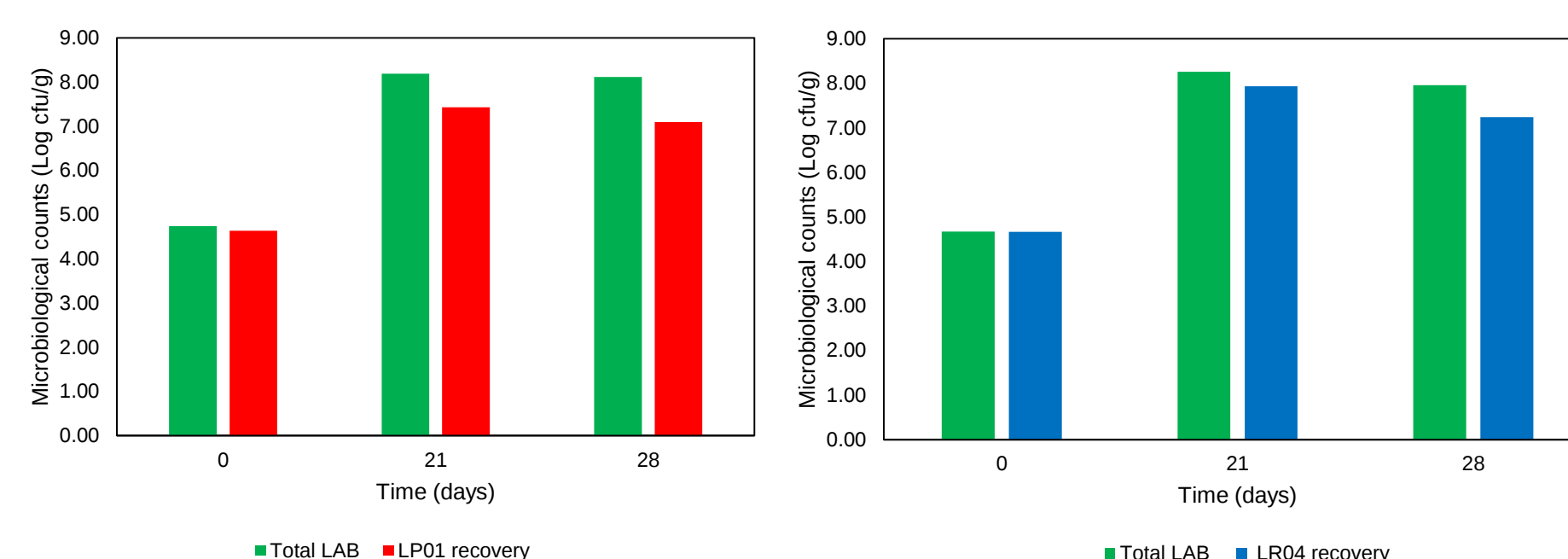


Figure 1. LP01 and LR04 counts in MRS_{rif} at each sampling point (days 0, 21, and 28).

The strains analysed had identical PFGE pulsetypes, confirming the presence of LP01 (a) or LR04 (b) throughout the whole study (Figure 2).

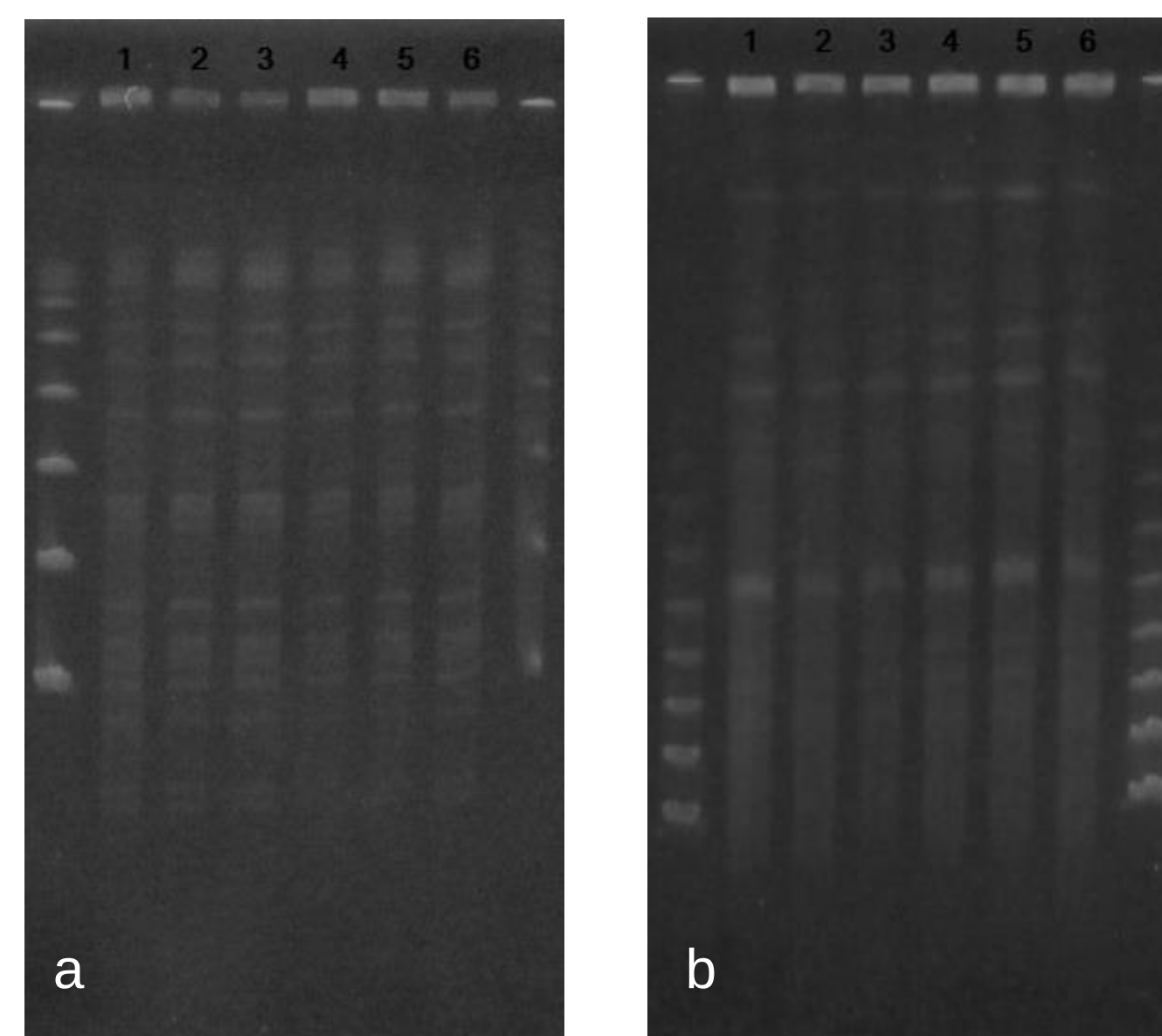


Figure 2. PFGE patterns of *Sfi*I-digested genomic DNA from LP01 (a) and LR04 (b).

CONCLUSION

Sauerkraut fermented with the LP01 or LR04 strain can be considered a probiotic food, containing approximately 10^7 cfu/g of the product.

REFERENCES

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- Gosiewski, T., & Brzychczy-Wloch, M. (2015). The use of PFGE method in genotyping of selected bacteria species of the *Lactobacillus* genus. In *Pulse Field Gel Electrophoresis: Methods and Protocols* (pp. 225-240). New York, NY: Springer New York.