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BOOK OF ABSTRACTS

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III6. Health Microbiology and Biotechnology

P289. Inhibition of *Clostridioides difficile* by lactic acid bacteria

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Clostridioides difficile infections have been associated with the antibiotics use (altering the intestinal microbiota, enabling the proliferation and toxins segregation by *C. difficile*). Moreover, the increase of antibiotic-resistance of hypervirulent strains turns imperative finding alternative therapeutics with preventive and/or prophylactic effects, as the use of probiotics. Lactic acid bacteria are considered as a major group of probiotic bacteria and their ingestion has been pointed out to confer a range of health benefits. There are several mechanisms by which probiotic strains may exert their inhibitory activity towards undesired enteropathogens: secretion of different metabolites as lactic acid, hydrogen peroxide, short-chain fatty acids, bacteriocins, proteases, etc. The objective of this study was to test the anticlostridial activity of 450 lactic acid bacteria (isolated from various food products) against 5 *C. difficile* strains. For those lactic acid bacteria demonstrating inhibitory activity, the mechanisms of inhibition was investigated.

Suspensions of each *C. difficile* strain were incorporated onto Brain Heart Infusion soft agar with 0.1% sodium thaurocolate and 10 µl drops of each lactic acid bacteria and their supernatants were spotted on the agar plate with the target organism. Clear supernatants of anticlostridial-LAB were sterilized, the pH adjusted, treated with catalase and proteinase K and the procedure was repeated for each treated supernatant.

Of the 450 lactic acid bacteria tested, only 77 were able to inhibit at least one *C. difficile* strain as a result of competition between cells. When the cells were centrifuged and the supernatant was used, 26 maintained their anticlostridial activity apparently: by the action of lactic acid (15), by the production of hydrogen peroxide (3), by the presence of proteinaceous compounds (6) and by the action of other nature compounds (5).

Although further in vitro tests are still needed, such as the ability of selected LAB to inhibit the invasion of *C. difficile* into intestinal Caco-2 cells, these LAB isolates may be potential anti-*C. difficile* strategies as alternative to antibiotics or as preventive of *C. difficile* infections.