



EVALUATION OF INTRACELLULAR α -FUCOSIDASE ACTIVITY OF BIFIDOBACTERIUM BY RESTING CELLS

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Introduction. Bifidobacteria can be found as components of the gastrointestinal microbiota, and play an important role in microbiota and promoting human health. Bifidobacteria are able to synthesize intracellular α -fucosidases; this enzyme is necessary to metabolize oligosaccharides from human milk. α -fucosidase catalyzes transglycosylation reactions and seems to be a promising synthetic tool because of its stereospecificity and ability to glycosylate a wide variety of acceptor molecules to obtain fucosyl-oligosaccharides similar to those of human milk. The aim of this study was to evaluate intracellular α -fucosidase activity in whole cells of three bifidobacteria.

Methods. *Bifidobacterium infantis* 17390, *B. infantis* 14461 and *B. longum* were grown in MRS broth at 35°C for 24 h. Enzymatic activity was recorded by the release of fucose from p-Nitrophenyl-fucoside (PNP-F) by cells harvested after 24 h fermentation. Growth was quantified by turbidimetry at 650 nm.

Results. Figure 1 shows the growth and pH evolution during 24 h. *B. infantis* 14461 had the highest growth and the lowest α -fucosidase activity of the three organisms evaluated. *B. longum* showed the highest α -fucosidase activity. These results are important because there are not previous reports evaluating the α -fucosidase activity in whole cells of bifidobacteria. This means that α -fucosidase could access to substrate (PNP-F) in the cell because no activity was found in fermented broth.

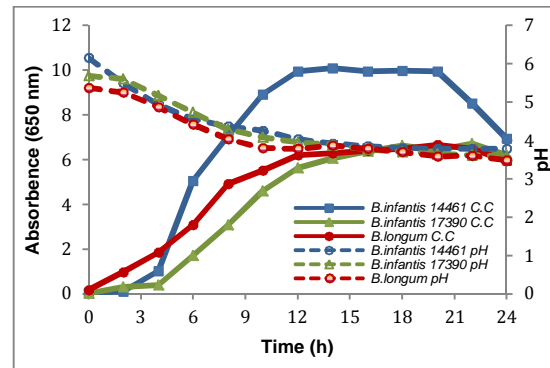


Fig.1 Growth and pH curves of bifidobacteria.

Table 1. Fucosidase activities from bifidobacteria.

strain	Fucosidase activity ($\mu\text{mol}/\text{mL} \cdot \text{min}$)	Fucosidase specific activity ($\mu\text{mol}/\text{mg} \cdot \text{min}$)
<i>B. infantis</i> 17390	2.4386	1.62×10^{-2}
<i>B. infantis</i> 14461	0.3308	2.20×10^{-3}
<i>B. longum</i>	2.9655	1.97×10^{-2}

Conclusions. *B. longum*, *B. infantis* 17390 and *B. infantis* 14431 cells, exhibited α -fucosidase activity. Since *B. longum* showed the highest activity and an adequate growth, it could be used as a source of α -fucosidase.

References.

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