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TRANSPORT OF ACETIC ACID AND OTHER WEAK ORGANIC ACIDS IN THE YEAST *ZYGOSACCHAROMYCES BAILII*

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Zygosaccharomyces bailii is a Krebs negative yeast able to grow under stress conditions and typically identified as a food contaminating species. The aim of the present work was to study the transport of acetic acid and other weak organic acids in the strain *Zygosaccharomyces bailii* IGC 1307 and its regulation by several carbon sources.

When transport was measured in cells grown in a medium with glucose or fructose, with labelled acetic acid at concentrations from 0.1 to 12 mM, pH 5.0, the Lineweaver-Burk plot of the initial uptake rates was linear and consistent with a Michaelis-Menten kinetics. Acetic acid uptake (pH 5.0) was accompanied by disappearance of extracellular protons, the uptake rates of which also followed Michaelis-Menten kinetics as a function of the acid concentration. The results indicated that probably a proton symport for the anion form of the acid was present. Transport of labelled acetic acid at pH 5.0 was accumulative, the accumulation ratio in terms of free acid being about 50. Furthermore, accumulated acid suffered efflux after the addition of cold acetic acid as well as of benzoic, sorbic or pentanoic acids. The results suggested that, probably, all these acids used the same carrier. Accordingly, benzoic, sorbic or pentanoic acids were competitive inhibitors of the acetic acid transport at pH 5.0. In addition and as expected their transport was also associated with proton uptake that followed Michaelis-Menten kinetics. Apparently, neither propionic acid nor lactic acid used this transport system since they were not competitive inhibitors of acetic acid transport. Furthermore, when any of these acids were added to suspensions of cells no transient external alkalinization indicative of proton uptake was observed.

Cells of *Z. bailii* grown in a medium with either acetic acid or ethanol as the carbon and energy sources were also analyzed for their capacity to transport acetic acid and the other weak organic acids referred above. The data indicated that, under these growth conditions, a mediated transport system for acetic was present and probably an acetate proton symport was again involved. However, the carrier appeared to be less specific, being able to accept not only benzoic, sorbic and pentanoic acids but also propionic and formic acids.