Microevolution of Bacillus subtilis in Response to Isopropanol Alcohol Stress

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From the moment we discovered the existence of germs, we have been trying to kill them. And from that moment, they have been adapting. Even now, as we introduce ever increasingly effective antibiotics, they are adapting and evolving to survive them. We need to know what the adaptive capabilities of the average bacterium are. My experiment answered a portion of this need by subjecting an experimental culture of Bacillus subtilis to a concentration of isopropanol alcohol over a six day experiment. The samples of the cultures were transferred to new tubes every two days to promote artificial selection. Control cultures from the source underwent identical treatment excluding exposure to isopropanol alcohol. After the three control and three experimental cultures had undergone six days of growth and three transfers at two day intervals, an analysis in which both control and experimental cultures were subjected to varying concentrations of isopropanol alcohol was performed. Bacillus Subtilis from the six cultures was each transferred into a set of ten tubes containing increasing concentrations of isopropanol alcohol. A spectrophotometer was used to measure absorbances of all cultures. At most concentrations, that absorbances indicated that the experimental culture had higher growth than the control culture. For example, at 0.024% concentration of isopropanol alcohol, the experimental culture measured 0.53 AU, while the control strain measured 0.45 AU. The results of the experiment indicated a finite increase in the growth of the experimental cultures compared to the control cultures. In six days, several cultures of Bacillus subtilis developed a resistance to isopropanol alcohol, which may have implications for the healthcare industry.

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