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Factors Affecting the Adhesion of Water-Stressed *Helicobacter pylori* to Plumbing Materials

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The most important route(s) of transmission for *Helicobacter pylori* among the human population has yet to be identified, but water and associated biofilms have been considered as potential environmental reservoirs in several studies. Although molecular techniques have identified *H. pylori* in water-associated biofilms, there is a lack of studies reporting what factors affect the attachment of the bacterium to plumbing materials. Therefore, the influence of shear stress, temperature, inoculation concentration, and different abiotic substrata on the total counts of attached *H. pylori* was evaluated using epifluorescence and scanning electron microscopy. Results were statistically significant for adhesion of the bacterium at different shear stress ($p < .001$), with higher numbers of attached *H. pylori* being obtained at the lowest flow velocities of the water. By contrast, temperature, inoculation concentration, and different substrata appeared to have no effect on attached bacteria ($p > .05$). The importance of shear stress in the attachment of the micro-organism indicates water storage reservoirs or wells, where low shear forces are usually present, as more probable locations for the subsistence of *H. pylori* attached to the surfaces and consequently embedded in biofilms. This conclusion supports the findings observed by others where the ingestion of well water was correlated with an increased chance of developing an *H. pylori* infection.
