

Public Abstract

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Title:Effect of red wine and grape juice against foodborne pathogens and probiotics

Numerous studies have been documented describing the burgeoning health benefits of red wine consumption, including anti-oxidative, anti-carcinogenic, anti-inflammatory and anti-cardiovascular and antibacterial properties. The inhibitory effects against pathogens may be attributed to the catechin and resveratrol found in red wines. This research was aimed to analyze the effects of red wine and grape juice against foodborne pathogens, *Helicobacter pylori*, *Listeria monocytogenes*, *Escherichia coli* O157:H7, *Salmonella Typhimurium* and *Shigella boydii*, and the probiotic bacteria, *Lactobacillus acidophilus*, *Lactobacillus paracasei*, *Lactobacillus rhamnosus*, and *Bifidobacterium animalis*.

Our work showed, via in vitro tests, the antimicrobial activity of specific red wines against various foodborne pathogens. This study also demonstrated that red wines did not drastically affect health beneficial probiotic cultures as they did pathogens. Upon treatment with 40% v/v red wines, the numbers of each pathogen decreased from 10⁸-10⁹ to 10⁴-10⁵ CFU/mL, indicating the potent antibacterial property of the wines tested. The inhibitory action of Barton Merlot, Pinot Noir and Shiraz was extremely rapid compared to Zinfandel and Cherry wine. On the other hand, all four probiotic strains tested survived exposure to up to 80% of each red wine, even though the decrease in numbers was significant from the initial 10⁷ CFU/mL. The pathogens were inhibited by up to 50-60% red grape juice. This indicates that the alcohol present in wines is not the only factor involved in their bactericidal effect. The inhibitory effect of Tropicana grape juice was extremely rapid against the probiotics tested. All four probiotics tested were significantly different in their inhibitory pattern ($P \leq 0.05$). Since the percentage of alcohol was almost the same in all the red wines tested, Tukey's Studentized Range test showing the presence of interaction effects among the red wines and pathogens and probiotics. The grape juice with the pathogens and probiotics were tested indicating that they were significantly different at $\alpha = 0.05$.