

Treatment of biofilm infections and development of biofilm resistance

104 : Natural Honey to Fight Candida Infections

Session B

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The incidence of *Candida* infections has increased in the last years, being attributed to the rise in the elderly population, the increasing number of immunocompromised patients, and the widespread use of indwelling medical devices. *Candida albicans* remains as the most prevalent species of these infections, but a clear rise in the proportion of non-*Candida albicans* *Candida* has been noted. A major virulence factor is the ability to adhere and to form biofilms in medical devices and host tissues, because of a higher tolerance to antifungal therapy. Consequently, there is an urgent need to develop strategies to fight these infections. Natural compounds, as honey, are attracting increased interest. Honey has long been used in traditional and complementary medicine because of its antibacterial, antifungal, antiviral, antioxidant and anti-inflammatory activities.

We aimed to evaluate honey as a novel strategy to fight infections. Honey was tested alone and in combination with antifungal agents (chlorhexidine, nystatin) against *Candida* (*C. albicans*, *C. tropicalis*, *C. papansilosis*, *C. glabrata*) single and mixed (with *Pseudomonas aeruginosa*) biofilms. A first screening of the treatment indicated higher efficiency of honey against *C. tropicalis*. For biofilms of this species, honey is capable of 2-log reductions after 24h of treatment. The combination of honey with nystatin and chlorhexidine reduces the antifungal dosage typically required in clinical settings by 50%, with a total biofilm reduction of 3-log with nystatin and 5-logs with chlorhexidine. In mixed biofilms of *C. tropicalis* and *P. aeruginosa*, honey at 50% or above reduces yeast and bacterial biofilm by 2-log and 4-log, respectively.

Altogether, our results highlight the great potential of honey as an alternative or complimentary strategy for the control of *Candida* infections.

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