

## STUDIES OF PATHOGENICITY OF *Candida albicans* WITH BACTERIA IN *Galleria mellonella* LARVAE

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For the understanding of infectious diseases and development of new medicines and therapeutic strategies, it is necessary in vivo studies with mixed microbial communities, particularly interactions between fungi and bacteria. The aim of this study was to evaluate the interaction of *Candida albicans* with *Staphylococcus aureus*, *Staphylococcus epidermidis* and *Pseudomonas aeruginosa* in *Galleria mellonella* larvae. In the assays were used 144 larvae to determine the survival curve, and 648 larvae to quantify the presence of microorganisms in the infected larvae. *G. mellonella* larvae were infected with sublethal concentrations of each microorganism previously defined; *C. albicans*, *S. aureus* and *S. epidermidis* with  $10^5$  cells/mL, and *P. aeruginosa* with  $10^2$  cells/mL. The following experimental groups were analyzed: I) *C. albicans*; II) *S. aureus*; III) *S. epidermidis*; IV) *P. aeruginosa*; V) *C. albicans* and *S. aureus*; VI) *C. albicans* and *S. epidermidis*; VII) *C. albicans* and *P. aeruginosa*; VIII) *C. albicans*, *S. aureus*, *S. epidermidis* and *P. aeruginosa*; and control group inoculated only with PBS. For survival assays the number of dead larvae was recorded daily for 7 days. For microbial quantification, the microorganisms were recovered from larvae hemolymph and the numbers of colony-forming unit count were determined. *P. aeruginosa* has promoted the death of all larvae within 24 h. In the other groups, during the period of study, it was observed: 68.7% of death of larvae infected with *S. aureus*, 56.2% of death of larvae infected with *S. epidermidis*, and 50% of death of larvae infected with *C. albicans*. When *C. albicans* was inoculated in association with staphylococci, the survival of larvae decreased. The associations of *C. albicans* with *S. aureus*, and *C. albicans* with *S. epidermidis*, have promoted, respectively, 87.5% and 85.7% of *G. mellonella* death. In association of *C. albicans* with *P. aeruginosa*, and in the group with all the microorganisms, all larvae were killed in 24 hours. The quantification of microorganisms from *G. mellonella* hemolymph has increased in relation to the time of infection. The number of CFU/ml of *C. albicans* was highest when the yeast was injected alone than in the mixed infection groups. It was concluded that *G. mellonella* larvae were susceptible to infections caused by yeast and bacteria, and the combination of these microorganisms increased the pathogenic potential, causing more deaths of this insect.

Keywords: *Candida albicans*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Pseudomonas aeruginosa*, *Galleria mellonella*.

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