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Synergistic antibacterial effect of probiotic lactic acid bacteria isolated from honey bees and propolis extracts on American and European foulbrood disease

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P larvae subsp. larvae, the agent of American foulbrood and *Melissococcus plutonius*, the agent of European foulbrood in honeybees are leading factors afflicting honey bee health and causing huge colony losses. To control this diseases antibiotics are used, which pose risks not only to honey bee health but is also a threat to humans. A number of biological controls methods are investigated in this regard for the control and prevention of these diseases. In this respect, probiotic lactic acid bacteria (LAB) are highly investigated. Propolis, a non-toxic wax like resinous substance found is bee hives is reported to be highly antibacterial and eco-friendly. In this study, we aimed to determine the synergistic antibacterial effect of probiotic lactic acid bacteria (LAB) isolated from honey bee *(Apis mellifera)* intestinal specimens, and different concentrations of ethanolic extracts of Propolis, against *Paenibacillus larvae* and *Melissococcus plutonius*. Initially, a number of LAB were isolated from honey bees by culturing the intestinal specimens on MRS and M17 media under aerobic and anaerobic conditions. The isolates were identified by biochemical and 16SrRNA sequencing. Four different concentrations of propolis collected from beehives of Alborz, Kurdistan and Tehran province, and the identified LAB isolates were tested for their antibacterial spectrum against *Paenibacillus larvae* and *Melissococcus plutonius*. Chlorhexidine (0.2%) and sterile saline were used as positive and negative control, respectively. The survival and growth of the *L. casei* TA0053, *L. lactis* NM00126, *P. acidilactici* TA0300 and *E. faecium* TA0312 (108 CFU/ml) in the presence of different propolis concentrations at different time intervals were investigated and their MIC determined. Synergistic effect of propolis and LAB bacterial strain against different cell concentrations of *Paenibacillus larvae* and *Melissococcus plutonius* was evaluated and their MIC recorded.

Biography

Naheed Mojgani has completed her PhD in Microbiology, is an Associate Professor at Razi Vaccine and Serum Research Institute (RVSRI), Iran. She is the Head of the Human and Animal Probiotic Research Lab at RVSRI and is a Senior Scientific Advisor at a probiotic manufacturing company (Biorun.Co Iran). She has commercialized several local probiotic isolates and also transferred the technology which she knows about probiotic supplement production. She has supervised several PhD and MSc students and has published more than 40 scientific papers and has presented her research work at several international and national conferences.

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