IN VITRO EFFECTS OF NATURAL PURIFIED PEPTIDES FROM THE NATIVE APIS MELLIFERA JEMENITICA LARVAE ON SALMONELLA ADHERENCE TO EPITHELIAL CELLS

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Abstract- Food borne non-typhoidal Salmonellosis outbreaks are an increasing public health problem in Saudi Araba. Resistance of Salmonella to therapeutic agents currently used for treatment of Salmonella infections is emerging as a global problem. Adhesion of *Salmonella* to intestinal epithelial cells, an important step in the development of disease, is currently the focus of novel anti-bacterial strategies. The aim of this study is to explore and highlight the diverse natural purified peptides, isolated from honeybee (Apis mellifera jemenitica), that have a potential antimicrobial effect. Also to evaluate the ability of these isolated purified peptide fractions (A, B, C, D, E and F) to prevent the attachment of Salmonella enteritidis (the causative agent for food poisoning) to human epithelial cells in vitro. Purified peptide fractions A, B, C and D significantly decreased the adhesion ($p<0.001$) of S. enteritidis to epithelial cells. Peptide fractions A and B showed the highest efficiency in this concern. Moreover, peptide fraction B significantly reduced the adhesion of S. enteritidis more than peptide A ($p=0.02$). All isolated purified peptide fractions showed detectable variable minimum inhibitory concentration (MICs) against standard bacterial strains used. Antimicrobial susceptibility of S. enteritidis and also Paenibacillus larvae (the causative organism for American foulbrood (*AFB*) for the six isolated purified peptide fractions were determined separately by Kirby-Bauer Disk Diffusion method, which revealed that peptide fraction B showed the highest antibacterial activity with inhibition zone about 21±0 mm and 20.5±0.71mm against S. enteritidis and P. larvae respectively, compared with ciprofloxacin antibiotic. This peptide fraction could be proposed as a suitable candidate for the treatment of human Salmonellosis as well as AFB. Characterization of the anti-Salmonellosis immune peptides are now underway, which may lead to synthetic production of a potential natural antibiotic against this disease.

Keywords- Adhesion; epithelial cells; Apis mellifera jementica, purified peptides, Salmonella, Paenibacillus larvae, American foulbrood disease, Salmonolosis.