ABSTRACT

Characterization of selected virulence factors of the genus *Serratia* isolated from animals.

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Bacteria of the genus *Serratia* are Gram-negative rods considered to be the representatives of human opportunistic pathogens. Infections occurring due to *S. liquefaciens* and *S. marcescens* presence can lead to endocarditis, arthritis, meningitis, urinary tract infections and even bacteraemia. Probably, the development of such infectious disorders in human body is a result of direct contact with animals. Among animals, *Serratia* sp. can be a cause of septicemia, necrotizing fasciitis, pneumonia, endocarditis or meningitis. Fimbriae (type I), lipopolysaccharide (LPS), phospholipase A (PhlA), hemolytic toxin (ShlA) and certain enzymes: (deoxyribonuclease, lipase, gelatinase or proteases) are the factors responsible for virulence of *Serratia* sp. and later development of the disease.

The main goals of this PhD thesis were to develop a methodology for the isolation of *Serratia* sp. from animal material and determine the occurrence of *S. liquefaciens* and *S. marcescens* in wild boars, roe deer, cows and pigs. The next steps included the determination of the potential virulence factors by detecting extracellular enzymes, selected virulence genes, the length of the O-specific chain of LPS and survivability in NHS.

The achievement of the above-mentioned goals was possible due to completion of the specific research tasks such as: isolation and identification of Gram-negative bacteria from microbiological swabs from wild boars, roe deer, domestic cows and pigs (CT and DNAse isolation medium, MALDI Biotyper method); detection of extracellular enzymes of *S. liquefaciens* and *S. marcescens* isolates (cultivation on DNAse, lipase and gelatinase agar plates); identification of selected virulence genes in *S. liquefaciens* and *S. marcescens* isolates (Polymerase Chain Reaction); characterization of the length of the O-specific LPS chain of *S. liquefaciens* and *S. marcescens* isolates and analysis of the susceptibility of *S. liquefaciens* and *S. marcescens* to the bactericidal activity of human serum.

The results showed that *S. liquefaciens* and *S. marcescens* were present in the material taken from wild boars, roe deer, cows and pigs. The occurence of extracellular enzymes and genes encoding fimbriae, hemolytic toxin (ShlA) and phospholipase (PhlA) was observed in most of the isolates. Such as resistance to human serum. All of the tested *Serratia* species had a long O-specific LPS chain.

Research results presented in this PhD thesis contribute to the development of biological sciences discipline by broadening the knowledge about the sources of isolation of *S. liquefaciens* and *S. marcescens* and determination of the virulence factors of the aforementioned species isolated from animals.

09.03.2023
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