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THE USE OF SDS-PAGE PROTEIN PROFILING IN THE CHARACTERIZATION OF FISH PATHOGENIC BACTERIA

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Abstract

This presentation contains results of a M.Sc and a Ph.D. thesis carried under Istanbul University Institue of Science. SDS-PAGE (Sodium Dodecyl Sulphate Polyacrylamide Gel Electrophoresis) protein-profiling method was used in the characterization of various fish pathogenic bacteria (*Vibrio/Listonella anguillarum*, *Staphylococcus spp.*) recovered from cultured marine fishes in Turkey for the first time.

Introduction

Aquaculture sector showed a great increase in the last decades in terms of species cultured and the amount of production. Bacterial fish diseases are among the most important obstacles in aquaculture. Identification and characterization of the fish pathogenic bacteria are of crucial importance for the quick treatment and determination of the further prevention strategies.

Materials and Methods

In this study, four different methods (sonication, acetone-SDS, Laemmli denaturation buffer and ready-to-use kit) were used for protein extraction from *Vibrio anguillarum*, *Staphylococcus epidermidis*, *S. aureus* and *S. capitis* subsp. *capitis* recovered from moribund gilthead seabream (*Sparus aurata*), European seabass (*Dicentrarchus labrax*) and sharpsnout seabream (*Diplodus puntazzo*) samples cultured in Turkey. After electrophoresis, gels were stained with coomassie brilliant blue and analyzed.

Results

The results of this study revealed that, *V. anguillarum* isolates recovered from moribund fish in Turkey belong to the O1 serotype of this species by the presence of a 41 kDa major outer membrane protein. The presence of a 140 kDa protein was detected in *S. epidermidis*, *S. aureus* and *S. capitis* subsp. *capitis* recovered from moribund fish samples, which enables these bacteria to attach surfaces and provide the ability to form a biofilm on surfaces. In addition, the presence of a 42 kDa protein was detected in these *Staphylococcus* species which acts as a receptor for transferrins in the blood and hence the pathogenic status of these isolates was confirmed.

Innovation

With these thesis studies, SDS-PAGE method was used in a comprehensive way in the characterization of fish pathogenic bacteria affecting Turkish marine aquaculture sector for the first time. With their characterization, proper protection strategies can be developed. Also, advantages and disadvantages of protein extraction methods were determined and by the application of little modifications, results were achieved faster.

Keywords: *SDS-PAGE, Vibrio anguillarum, Staphylococcus epidermidis, membrane proteins*

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