

nucleotide sequences from cultured isolate were identical with *A. phagocytophilum*.

Conclusions: We secured the strain of *A. phagocytophilum* (AAIK isolate) in black-striped field mice (*Apodemus agrarius*) in ROK. This strain is expected to contribute to public health and veterinary medicine.

References

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Isolation, Biotyping and Serotyping of *Streptococcus parauberis* Strains from Olive Flounder (*Paralichthys olivaceus*)

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Introduction: Streptococcosis is an important bacterial disease, which causes severe economic losses in range of aquaculture industries across almost all continents. In particular, the strain *Streptococcus parauberis* is one of the most common bacterial pathogen responsible for streptococcosis in both wild and cultured olive flounder (*Paralichthys olivaceus*) in South Korea and Japan. Recently, matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS) had emerged as a promising approach for the identification of several microorganisms including yeast, bacteria and even bacterial pathogens from human.

Materials and Methods: A total of 145 strains were isolated from the spleens of diseased olive flounder collected from aquaculture farms in Jeju island of South Korea between 2003 and 2008. These isolates were identified by MALDI Biotyper using the method of direct colony and protein extraction. To identify the characteristics of the serotypes, we performed agglutination reaction test using anti serum of each type. A main spectra library (MSP) dendrogram was generated by MALDI Biotyper 3.0 software based on mass signal patterns and compared with the serotype resulted from agglutination test.

Results: Comparing the identification rates between Bruker Daltonics database and newly added data entries in our laboratory using the direct preparation method and the protein extraction method by MALDI-TOF MS, the rate of

species and genus level rose from 88.97% to 93.70% and 97.93% to 100% respectively and the rate of “no reliable identification” dropped from 11.03% to 6.21% and 2.06% to 0% respectively. MSP dendrogram was generated by MALDI Biotyper software, which revealed that 145 of *S. parauberis* isolates are divided into two separate groups, i.e., cluster1 and cluster2. Sixty-three isolates of *S. parauberis* belonged to cluster1 and eighty-two isolates to cluster2. The result of agglutination test showed that 145 isolates of *S. parauberis* were divided into two serotypes, except for S13 and S114 strains. Ninety-one and fifty-four strains were agglutinated against serum of FP1 (anti-*S. parauberis* type I) and NA1 (anti-*S. parauberis* type II) diluted from 1:512 in PBS, respectively. By comparing the MSP dendrogram with the serotype obtained from the agglutination test, ninety isolates of *S. parauberis* belonging to cluster 1 were identical to serotype I (100%); whereas, the isolates in cluster 2 encompassed serotype I (32.93%), serotype II (64.63%), both agglutinated isolates (1.22%), and no agglutinated isolates (1.22%). Comparison of peak lists between cluster1 and cluster 2 with regard to spectrum peak frequency, position, and intensity showed that the 145 strains commonly shared majority of the peaks but there were three distinct peaks that might differentiate each cluster. These significant differences in peak positions, i.e., 2173.55, 3262.14, 6526.085 *m/z* were observed only in the cluster 1 spectra and not in the cluster 2 spectra. To identify specific masses that could be useful for distinguishing each serotype in cluster2, we compared the combination of peaks with regard to their serotype. Two signals, approximately 3300 and 6603 *m/z* were observed in the whole spectra but not in serotype II.

Conclusions: We applied Bruker Biotyper MALDI-TOF MS system and performed serological test to characterize a large collection of *S. parauberis* isolates from diseased olive flounders. Our findings will be fundamental for epidemiological studies on *S. parauberis* at species and bioserotype level.

P-040

A Survey of Ticks (Acari: Ixodidae) on Goat, Cow, Wild Boar and Near Grazing Animal Farms

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Introduction: To provide basic information about ticks related to their vectors and tick-borne diseases on animals and habitats in Republic of Korea.

Materials and Methods: Ticks were collected from goat, cow, wild boars and the habitats near grazing goat and cow farms.