



# Case of remarkable research of the National Institute of Fisheries Science in 2022

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National Institute of Fisheries Science (NIFS) is the national comprehensive research institute in oceans and fisheries science with over 100 years of history since 1921 (Won & Kim, 2021). The institute carries out a wide range of research on oceans and fisheries, including the marine environment, climate change, fisheries resources, fisheries engineering, aquaculture, aquatic diseases, biotechnology, and seafoods.

NIFS is responsible for supporting the fisheries policy and disseminating the technologies through a wide range of marine and fisheries research. For the effective implementation of these responsibilities, NIFS has established its vision of “To achieve sustainable oceans & fisheries with innovative research, To become world class research institute”, as well as four strategic directions: (1) Sustainable growth; (2) Enhancing climate change-related research & field technology; (3) Advanced convergence technology; and (4) Strengthening domestic & foreign cooperation.

This special issue of Fisheries and Aquatic Sciences (FAS) includes 5 articles representing the above strategic directions of NIFS in 2022. I would like to introduce these five achievements.

The first achievement applying to the strategic direction (1) “Sustainable growth” is related to the efforts for the conservation and management of fisheries resources. This study tried to attach the tracking transmitter to the seal, aiming to monitor the movements of a spotted seal and provide understanding into

the habitat preferences and movement patterns of free-ranging spotted seals (*Phoca largha*) around Baengnyeongdo Island.

The second achievement corresponding to the strategic direction (2) “Enhancing climate change-related research & field technology” is related to the baseline data for climate change. This study provides understanding into the long-term pattern changes of sea surface temperature during summer and winter due to climate change in Korean waters. I look forward to this achievement aiding to respond to the damage from fisheries disasters and prepare for the climate crisis.

The last three achievements are related to the strategic direction (3) “Advanced convergence technology”, specifically, seawater biofloc technique, freshwater aquaculture technique and DNA-based molecular biology technique.

The third achievement on the seawater biofloc technique is related to the effects of biofloc on immune responses of Fleshy shrimp (*Fenneropenaeus chinensis*) postlarvae and adults. Kim et al. (2015) reported that postlarvae of *F. chinensis* showed a lower biofloc feeding efficiencies. This study is very meaningful because it explains the cause of low biofloc feeding abilities and immune responses through the observations of morphological difference of the maxilliped structure.

The fourth achievement on the freshwater aquaculture technique is related to the outdoor aquaculture of Eastern catfish (*Silurus asotus*) in Korea. According to the drop in production

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of naturally caught *S. asotus* in Korea and the decrease in the number of *S. asotus* fish farms (Choi et al., 1992; KOSIS, 2015, 2022), the demand for the development of aquaculture technology has increased. This study provides the report of fish farm monitoring on the outdoor aquaculture system of *S. asotus*, including weight gain rate, specific growth rate and feed coefficient rate. The results of this study are expected to be used as basic data for the development of catfish aquaculture industry.

The final achievement on the DNA-based molecular biology technique is related to the distinction of eleven species of the family Pleuronectidae using DNA-based techniques. Family Pleuronectidae is known to be difficult to classify morphologically due to their similar appearances. This study provide a powerful tool for the discrimination of the 11 species of the family by establishing a species-specific multiplex polymerase chain reaction analysis method (Koh et al., 2011; Silfvergrip, 2009) using DNA-based molecular biology techniques and can contribute to the systematic resource management and food safety of imported and local flounder species.

Korea's fisheries industry faces challenges, including climate change, decrease in offshore fishing productivity, deterioration of fishing grounds, and strengthened international fisheries management regulations. It is time to gather our wisdom to solve the challenges in the fisheries industry. The articles presented in this special issue exemplify that. We hope that this issue will contribute to laying a good foundation for Korea's fisheries industry to grow as a strong pillar of the national economy, not as a traditional industry in decline, but as a high-tech and high value-added industry.

Finally, to continuously develop the fisheries industry, more advanced technology development should be conducted based on systematic research.

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No potential conflict of interest relevant to this article was reported.

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#### Availability of data and materials

Upon reasonable request, the datasets of this study can be available from the corresponding author.

#### Ethics approval and consent to participate

Not applicable.

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