

JEB - Special Issue Ecology and Systematics

Preface

This Special Issue entitled: **Ecology and Systematic** contains 17 articles that have been selected from the papers presented in the Special Conference 2018 "Approaching Systems Biology in Marine, Animals and Humans", held during **October 5, 2018** at **Soonchunhyang University, Asan, Republic of Korea**.

The theme of this special issue is based on the field of systematic biology related to marine ecosystems. Mainly, the environmental factor such as water temperature in the marine ecosystem studied that affect the spatial and temporal distribution of the animal and plant plankton and macroalgae, the basic producer. There are also researches on protein identification and virus control using bioinformatics, and identification of specific gene expression according to changes in the environment.

For this, the conference where these papers of Special Issue were presented to answer questions such as:

- ☞ What is the species composition of zooplankton, which plays an important role in marine life?
- ☞ What is the relationship between zooplankton species distribution patterns and environmental factors?
- ☞ What is the zooplankton community structure in the same waters?
- ☞ What is the ecology of a particular species due to ocean temperature changes?
- ☞ Are there any growth effects of microalgae and algae on environmental changes?
- ☞ What is the effect of matured on temperature change?
- ☞ Is it possible to express NOS by chemical administration?
- ☞ Is it possible to characterize specific proteins using bioinformatics?
- ☞ How does the virus control the shrimp?

This Special Issue contains articles, convening both basic and applied aspects of environmental issues including biomass production, coastal ecology, bioinformatics, morphological taxonomy, and embryonic development. The highlights of the research papers of this Special Issue are as follows:

Microalga, *Haematococcus pluvialis* is a natural source of astaxanthin and accumulates astaxanthin in the red dormant cell stage. The first article, of this Special Issue, authored by Jung et al. reports on the growth rate and photosynthetic pigments of *H. pluvialis* under varied conditions, and also reports as taxanth in production by different extraction methods and its antioxidant activity.

In another synchronicity of climate fish species study using the ecological parameter, Rahman *et al.* observed changed climate species distribution and population structure. Regarding studies on the marine ecosystem, Jung *et al.*, studied seasonal variation in carbohydrates, amino acid and mineral contents of the red alga, *Pyropia yezoensis* at two sites in Korea. Han *et al.*, reported relationship between the changes in survival rate, growth development of secondary sexual characters of juvenile *A. vulgaris* to changing oceanic temperature. Similarly, Jo *et al.*, from their study concluded that temperature influenced embryonic development rate, generation time and population variation of *Acartia steueri* whereas Kim *et al.* reported that fecundity of *Acanthomysis koreana* was higher in spring season than autumn. These results give valuable information about further research in these areas. Furthermore, the distribution indicator species study also showed novel results and new aspects.

More specifically, articles authored by Lee *et al.*, Pardianto *et al.*, Oh *et al.*, highlights the relationship between zooplankton and environments. Although they are sub-organisms in natural ecosystems, they play an important role as primary producers linking large animals with plants. Their distribution was investigated by studying water temperature, salinity, water flow, brightness and depth as well as the amount of nutrient prey and predators. Most of the plankton species listed were copepods and occupied 70% sea, and the sea was more diverse and complex than terrestrial. Whales and krill are the most important predators and food sources in the Antarctic ecosystem. They can be divided into holoplankton and meroplankton. They are responsible for recycling elements as well as serve as indicator

organisms in the sea. According to the research, most ecosystems seem to be diverse and well circulated. These data will be an important source of future ecosystem changes due to environmental changes.

Seaweed culture also showed differences in proximate components, amino acids and minerals depending on the environmental effects. Microalgae also showed growth differences due to physical factors such as light source and pH, and upgraded extraction methods such as SFC were also introduced

Lectins are proteins that bind proteins to carbohydrates and act as a biological cognitive function between cells and proteins. Here, in this issue, Patnaik *et al.* isolated 1-CRD galectin from the mollusk, *Incilaria fruhstorferi* and identified its structure through bioinformatics technology. Moreover, Baliar Singh *et al.*, identified hepatopancreas-associated lectin from giant freshwater prawn, *Macrobrachium rosenbergii*. Genetic sequences identified through these studies may be helpful in predicting the expression rate or environmental variation of other species

Additional fields include studies on animal physiology. Yu *et al.*, in their study demonstrated that altered distribution of neuronal cell populations in hippocampus leads to neuronal loss induced by an inhibitory neurotransmission abnormality, leading to epileptogenesis in Traumatic Brain Injury patients. Park *et al.*, reported that expression of nNOS in neurons plays an important role in the regulation of tear inducing, suggesting that endogenous NOS is closely related to direct secretion of exogenous lacrimal gland and direct or indirect regulation of blood. The study of Kim *et al.* suggests the scientific value of finding age-specific differences using pictures of thyroid cartilage. Further, in another study, Kim *et al.* investigated the expression of nitric oxide synthase in sub-lingual glands of rabbits and evaluated the effects of L-NAME in NOS expression. Such studies can be of great help in understanding the mechanisms of the human body.

This Special Issue concludes with the review article of Shin *et al.* on Progress in alternative antifouling technologies for healthy biodiversity. This Special Issue is expected to contribute to a predictable biology area for higher ecosystems, as the present rapid ocean temperature has proven to be highly influenced by the primary ecosystem. I hope the papers of this Special Issue will make a good reference material and will be of great use to readers.

I would like to thank the authors who have contributed their research work for this Special Issue and also appreciate their efforts for patiently revising their papers to meet the suggestions of reviewers and responding to the requirement of the journal.

I would like to extend special thanks to the Editor-in-chief, Dr. R.C. Dalela for once again accepting our invitation and giving us a good opportunity to publish research papers in the Special Issue of JEB. I would like to thank the Editorial Board and R&D Division of JEB for their constructive comments on the contents of the paper. The co-operation received by the Editorial office of JEB right from submission to final publication is highly appreciated. Once again it was a nice and delightful experience to work and publish our research work in the *Journal of Environmental Biology*.

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Professor Hyun Woung Shin
Department of Life Science and Biotechnology,
Soonchunhyang University,
Chungcheongnam-do, 336-745, South Korea
Email: happynews4me@gmail.com