1st International Webinar

Symposium and workshop for the undiscovered taxa of Korea

DATE | 14 September 2021

PLACE | Rm. 1003, Bldg. Global Plaza, Kyungpook National University, Daegu, Republic of Korea

Host and Sponsored Organizations

KNU KYUNGPOOK NATIONAL UNIVERSITY
Institute for Phylogenomics and Evolution

National Institute of Biological Resources

Participating Organizations

Institute for Phylogenomics and Evolution, KNU, Korea

National Scientific Center of Marine Biology, Russia

Institute of Ecology and Biological Resources, Vietnam

Tohoku University, Japan

PROGRAM

9:00-9:30

Opening address
Ui Wook Hwang
(Director, Institute for Phylogenomics and Evolution, KNU, Korea)

9:30-10:00

Plenary lecture
Ui Wook Hwang
(Director, Institute for Phylogenomics and Evolution, KNU, Korea)

Molecular phylogenetic and systematic studies on invertebrates in East Asia

S1 Taxonomy and Ecology of Freshwater **Bivalves**

Presentation	10:00-10:30 Dr. Konstantin Lutaenko (National Scientific Center of Marine Biology, Russia) Current problems in taxonomy and faunal studies of marine bivalves in the North-east Asia
Workshop	10:30-11:00 Dr. Konstantin Lutaenko (National Scientific Center of Marine Biology, Russia) Bivalves and their diversity in Far East Asia
Student Presentation	11:00-11:15 Gyeongmin Kim (Kyungpook National University, Ph.D course student) Taxonomy and diversity of fresh water bivalves in Korea
Open Discussion	11:15-11:45 Dr. Konstantin Lutaenko (National Scientific Center of Marine Biology, Russia) Dr. Ui Wook Hwang, Dr. Eun Hwa Choi, Dr. Jihye Hwang, Dr. Bia Park, Gyeongmin Kim, Seonghyun Hong (Kyungpook National University, Korea)

S2 Taxonomy and Ecology of **Gastropods**

Presentation	13:00-13:30 Dr. Kazu Kimura (Tohoku University, Japan) Phylogenetic position of the Japanese land slug Genus *Granulilimax* Minato, 1989
Workshop	13:30-14:00 Dr. Kazu Kimura (Tohoku University, Japan) Gastropods and their diversity in Eastern Asia
Student Presentation	14:00-14:15 Cho Rong Shin (Kyungpook National University, Ph.D course student) Taxonomy and diversity of gastropods in Korea 14:15-14:30 Seonghyun Hong (Kyungpook National University, MS course student) Population genetics of *Nerita albicila*
Open Discussion	14:30-15:00 Dr. Kazu Kimura (Tohoku University, Japan) Dr. Ui Wook Hwang, Dr. Eun Hwa Choi, Dr. Jihye Hwang, Dr. Bia Park, Cho Rong Shin, Seonghyun Hong (Kyungpook National University, Korea)

S3 Taxonomy and Ecology of **Millipedes**

Presentation	15:00-15:30 Dr. Ahn D. Nguyen (Institute of Ecology and Biological Resources, Vietnam) An overview of research on soil invertebrates of Vietnam
Workshop	15:30-16:00 Dr. Ahn D. Nguyen (Institute of Ecology and Biological Resources, Vietnam) Millipedes and their diversity in Vietnam
Student Presentation	16:00-14:15 Gyeongmin Kim (Kyungpook National University, Ph.D course student) Taxonomy and diversity of millipedes in Korea 16:15-16:30 Gankhuyag Enkhtsetseg (Kyungpook National University, Ph.D course student) A review of grasshopper in Mongolia 16:30-16:45 Akintola Ashraf Akintayo (Kyungpook National University, Ph.D course student) Phylogeny of *Anopheles sinensis*
Open Discussion	16:45-17:25 Dr. Ahn D. Nguyen (Institute of Ecology and Biological Resources, Vietnam) Dr. Ui Wook Hwang, Dr. Eun Hwa Choi, Dr. Jihye Hwang, Dr. Bia Park, Gyeongmin Kim, Gankhuyag Enkhtsetseg, Akintola Ashraf Akintayo (Kyungpook National University, Korea)

17:25-17:55

Closing remark — Ui Wook Hwang (Director, Institute for Phylogenomics and Evolution, KNU, Korea)

17:55-18:00

Photo time

ABSTRACT

Molecular phylogenetic and systematic studies on invertebrates in East Asia

Ui Wook Hwang

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Due to the enormous arthropod and mollusk species diversity and ecological importance, numeral and continuous attempts on systematic studies have been performed. . However, there still remain a number of species to be recorded from East Asian fauna including Korean Peninsula, Russia, China, Vietnam and Japan, etc. Here, I present some representative and published/publishable research results related to East Asian mollusks and arthropods: chitons, crabs, sea slaters, sea spiders, and myriapods, etc. In addition, I happily introduce the research and education program entitled to undiscovered taxa in South Korea supported by the Ministry of Environment and KNU, South Korea. I believe that today's symposium and workshop will become the historical first step to facilitate active cooperation for education and research of arthropod and mollusk systematics among South Korean, Russian, Vietnamese, and Japanese research institutions.

Current problems in taxonomy and faunal studies of marine bivalves in the North-east Asia

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The bivalve molluscan fauna of the North-East Asia is rather well-studied, and Chinese, Japanese, Korean and Russian malacologists contributed much to faunal and taxonomic studies; in the 19th century, European and partly American workers had also made many efforts to study this fauna. However, despite publication of national catalogues, there is still no full inventories of marine bivalves for the entire East and Yellow seas which makes some problems in biogeographical analysis. Our knowledges are split into national, no synthesis is available as compared to the opposite coast of the Pacific Ocean where Canadian, American and Argentinian malacologists have published a series of comprehensive monographs. Present talk includes the following aspects:

- How many species of marine bivalves live in the north-east Asia?
- What is known, little-known and unknown in regional faunal studies
- Biogeographical patterns of bivalve fauna
- Global warming and bivalve migrations
- Problems in taxonomy of selected taxa
- Molecular approach to taxonomy, phylogeography and traditional taxonomy

Estimates for regional and local species richnes are discussed.

We propose to recognize in the East Sea and adjacent areas a boreal Japanese-Manchurian Province This province encompasses the northern half of the East Sea, Hokkaido, the southern Kurile Islands, and Aniva and Terpenya bays, Sakhalin Island, southern Sea of Okhotsk. The southern part of the East Sea is occupied by the subtropical Sino-Japanese Province extending into the Yellow Sea, southern Japan, and the East China Sea. There is a transitional belt marking the decline of cold-water bivalve mollusks and a significant increase of warm-water species between Yeongil Bay and Busan on the continental coast of the East Sea and, similarly, a corresponding zone between the Noto Peninsula and Tsugaru Strait in the eastern part of the sea. This belt denotes the boundary between subtropical and boreal (or warm-temperate and cold-temperate) zones in the East Sea.

In South Korea warm-water mollusks constitute a large majority (78%), with the prevalence in this biogeographical group of subtropical (38%) and tropical-subtropical species (31%). The proportion of boreal species is much lower, only 18%. These proportions demonstrate that the bivalve molluscan fauna of the eastern coast of Korea is subtropical, and related more to the fauna of the East China Sea than to the northern East Sea. Species richness of bivalves of the East Sea coast of Korea (316) is more than those of the entire temperate North-Western Pacific (279). Biogeography of the continental coast of the East Sea is presented.

Species richness of bivalves in the western part of the East Sea is 371, in eastern – 546; a total of 600 species of bivalves is known in the East Sea which makes this area as one of the biodiversity hot-spot in the world.

Traditional and molecular taxonomy of bivalves is discussed, and some examples of complicated taxa are presented.

Phylogenetic position of the Japanese land slug Genus *Granulilimax* Minato, 1989

Kazuki Kimura

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Granulilimax fuscicornis (Minato, 1989) is an endemic land slug of Japan. This slug was described as a member of the stylommatophoran family Philomycidae Gray, 1847, and subsequently transferred into the systellommatophoran family Rathouisiidae Heude, 1885. It is still unclear whether the taxonomic revision to Rathouisiidae is supported by genetic data. In this study, we investigated the phylogenetic position of the genus *Granulilimax* using *G. fuscicornis* and an undescribed species *Granulilimax* sp. Although the phylogenetic relationships between *G. fuscicornis* and rathouisiid slugs remain to be solved, our preliminary molecular analysis using mitochondrial *COI* and nuclear *18S* genes strengthen the idea that the Japanese *Granulilimax* slugs belong to Systellommatophora.

An overview of research on soil invertebrates of Vietnam

Anh D. NGUYEN

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The work presents the overview of research on soil invertebrates in Vietnam to date. It focuses on several main groups of soil invertebrates, such as earthworms, millipedes, centipedes, spiders, scorpions, terrestrial snails and slugs, microarthropods, and so on. Currently, the soil fauna of Vietnam has been well studied with nearly 2,348 species, 744 genera, 212 families. Out of well-known groups, the soil fauna of Vietnam also contains many poorly known groups, such as Velvet worms (Onychophora), Whip spiders (Amplypygi), Whip scorpions (Uropygi), Symphylans, Pauropods, some spider families (Solifugae, *etc.*)

Because of the important roles of soil invertebrates, we also propose further research directions on the soil biology of Vietnam as followings: (i) the biodiversity of soil organisms, (ii) ecology and function of soil organisms, (iii) the genetic responses, behavior changes, distribution of soil organisms under the environmental and climatic changes.