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Press Release

For Immediate Release

HKU Paleontologists Discover Linkages between Oceanic and Continental Settings and Past East Asian Summer Monsoon Dynamics

August 28, 2018

In online edition of *Geophysical Research Letters*, **Dr Cheung Ching Wa Richard**, **Dr Moriaki Yasuhara**, **Dr Briony Mamo** and **Dr Hokuto Iwatani** (from School of Biological Sciences and Swire Institute of Marine Science, The University of Hong Kong), in collaboration with scientists in Shimane University, Pusan National University, Korean Institute of Geoscience and Mineral Resources, Kyoto University, and Shinshu University, reported their discovery on East Asian monsoon dynamics over the past 1,000 years.

The East Asian summer monsoon (EASM) is a determining factor of regional precipitation in East Asia that subsequently affects socioeconomic activities of regional populations such as agriculture. However, spatial and time-series trends of decadal- to centennial-scale East Asian summer monsoon strength over the last millennium remain poorly understood often show great inconsistency among records from various places of East Asian region, even with precisely dated Chinese cave stalagmite records. Dr Cheung, Dr Yasuhara and their collaborators identified four pervasive East Asian summer monsoon strengthening events at 1250, 1450, 1550, and 1900 CE and found that oceanic and continental settings could partially explain spatial differences in Asian summer monsoon trends at this scale. Ocean sediments may better directly record past East Asian Summer Monsoon signals than terrestrial records. In addition, they found that global ocean circulation may be weakened during these East Asian summer monsoon events. These findings help to better understand Asian monsoon dynamics in the past, present, and future in this rapidly changing planet.

The research group used fossil Foraminifera and Ostracoda preserved in a sediment core from the East Asian coast as model organisms to reconstruct the variability of the East Asian summer monsoon in the past, as these small (usually <1 mm) aquatic benthos are very sensitive to water conditions. The specimens were identified under the microscope, and then standardized abundance of monsoon indicator species (= indicative of brackish water condition due to increased rain fall) were computed. Temporal variation of the records in this study showed striking similarity to other East Asian summer monsoon proxies in East Asia.

“This project is based on the research conducted when I was an undergraduate student in the Environmental Science Major of the Faculty. I continued working on it during my PhD study. Asian Monsoon is very important for Asian society, culture, and agriculture, yet currently available proxies do not show consistent East Asian summer monsoon dynamic over the past millennium. Hopefully, the discovery in this project can generate deeper discussion regarding provincialism and teleconnection of Asian monsoon dynamics.” said Dr Cheung.

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About the Research Paper

Journal: *Geophysical Research Letters*

Title: Decadal- to Centennial-Scale East Asian Summer Monsoon Variability Over the Past Millennium: An Oceanic Perspective

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Link of the research paper: <https://doi.org/10.1029/2018GL077978>.

About the Journal

Geophysical Research Letters has been a top journal in the field of geosciences for years. The journal *Geophysical Research Letters* publishes high-impact, innovative, and timely communications-length articles on major advances spanning all of the major geoscience disciplines. For more information, please visit <https://agupubs.onlinelibrary.wiley.com/journal/19448007>.

Please visit <https://www.scifac.hku.hk/news/media?page=1> for images download

Image Captions



Image 1: Scanning Electron Microscopy image of selected fossil foraminifera and ostracods from the study site.

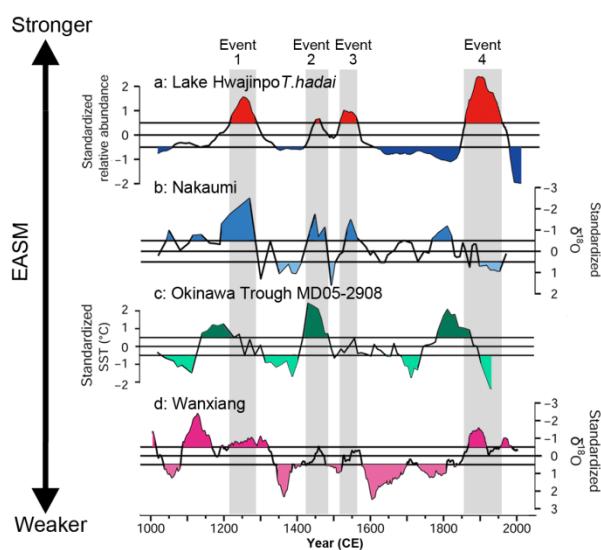


Image 2: Comparing Lake Hwajinpo record (top; this study) with other East Asian summer monsoon (EASM) proxies in East Asia. Four pervasive EASM strengthening events identified in this study were highlighted by gray bands.



Image 3: Dr Cheung Ching Wa Richard (left) and Dr Moriaki Yasuhara (right) working in their laboratories at the School of Biological Sciences, The University of Hong Kong.