

**INSTITUTE OF ENVIRONMENTAL SCIENCE & METEOROLOGY**  
**College of Science**  
**UP Diliman, Quezon City**

**ANNOUNCEMENT OF DISSERTATION PROPOSAL PRESENTATION**

of

**JAY A. EJARES**

**MANAGING THE RISKS: UNDERSTANDING THE INVASION SUCCESS OF *HYDROIDES*  
*ELEGANS* (HASWELL, 1883) AS MARINE INVASIVE SPECIES IN THE PHILIPPINES**

for the degree of Ph.D. in Environmental Science

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via Zoom \*

THESIS ADVISER

**Benjamin M. Vallejo, Jr., Ph. D.**  
Professor  
Institute of Environmental Science  
& Meteorology  
College of Science  
University of the Philippines  
Diliman, Quezon City

THESIS CO-ADVISER

**Mudjekeewis D. Santos, Ph. D.**  
Scientist II & Officer-in-Charge  
Training Division  
National Fisheries Research and  
Development Institute  
Diliman, Quezon City

THESIS READER

**Satoshi Nagai, Ph. D.**  
Group Leader  
National Research Institute of Fisheries Science  
Bioinformatics and Biosciences Division  
Japan Fisheries Research and Education Agency  
Yokohama, Japan

# **Managing the Risks: Understanding the Invasion Success of *Hydroïdes elegans* (Haswell, 1883) as Marine Invasive Species in the Philippines.**

**Jay A. Ejares**

Institute of Environmental Science and Meteorology  
University of the Philippines, Diliman

## **ABSTRACT**

Marine transport enables about 80% of the global trade production and supported approximately 10 billion tons of world seaborne trade. As these would benefit the economy, it poses environmental risks such as the transfer of species through biofouling and ballasting in ships. According to the International Maritime Organization (IMO), 3 to 5 billion tons of ballast water are moved every year, enabling the transfer of different marine organisms. Some of these evolve to become invasive, which has detrimental and irreversible consequences to the environment. One of the most notorious biofoulers in Philippine ports is the calcareous tubeworm, *Hydroïdes elegans*. Currently, there is no detailed study focusing on *Hydroïdes* in the Philippines. Thus, this study will focus on the short-term recruitment process, determination of cryptic species, the population genetic structure analysis, tracing the species' demographic history, and haplotype network analysis.

The short-term recruitment and succession process will be monitored over four time periods (2 days, five days, ten days, and 15 days). The experiment will also be conducted in 2 rounds (wet and dry season) to determine a seasonal variance of the recruitment and succession process. In addition, the diversity and abundance of biofouling organisms will be analyzed using different diversity indices.

The study will also employ the integrative taxonomic approach combining morphological and molecular techniques. DNA barcoding using cytochrome c oxidase I (COI) sequences will be performed to determine the presence of cryptic species. Determination of cryptic species will remove species ambiguity and increase the taxonomic resolution. Genetic diversity, population structure, demographic history, and haplotype network analysis will determine whether the population of *H. elegans* in the Philippines belongs to a single metapopulation or complexes of subpopulations. Further, this will evaluate to what degree the population of *H. elegans* is genetically structured. With the advancement of molecular techniques, species delineation can be more accurate, giving researchers a broader understanding of species invasion.

With this study's result, top agencies can formulate an effective risk management program and pose biosecurity measures, mainly because regulations to minimize invasive species' introduction have not yet been fully enforced in the Philippines.