

The Research Group  
Ecology, Evolution & Genetics

has the honor to invite you to the public defence of the PhD thesis of

**Jasper Dierick**

to obtain the degree of Doctor of Sciences

Title of the PhD thesis:

**Reproductive Strategies and Population Connectivity of  
Indo-Pacific Seagrasses**

### Curriculum vitae

Supervisors:

**Prof. dr. Tom Van der Stocken (VUB)**

**Em. prof. dr. Ludwig Triest (ULB)**

The defence will take place on

**Tuesday, May 6, 2025 at 4 p.m.**

VUB Etterbeek campus, Pleinlaan 2, Elsene, auditorium I.0.02

### Members of the jury

Prof. dr. Iris Stiers (VUB, chair)

Prof. dr. Kristien Brans (VUB, secretary)

Prof. dr. Olivier Hardy (ULB)

Em. prof. dr. Jeanine Olsen (Rijksuniversiteit Groningen, NL)

Jasper Dierick obtained his MSc in Biology from Ghent University in 2015. In 2018, he began his PhD at VUB, supervised by Em. Prof. dr. Ludwig Triest and Prof. dr. Tom Van der Stocken. His research focuses on reproductive strategies and population connectivity of Indo-Pacific seagrasses. Jasper has published in 2 peer-reviewed journals and presented at 6 (inter)national conferences and symposiums. He supervised 14 BSc and MSc theses and contributed to several courses as a teaching assistant during his PhD.

### Abstract of the PhD research

Seagrasses, an ecological group of submerged marine flowering plants, are vital components of coastal ecosystems. They are hotspots of marine biodiversity and provide numerous ecosystem services, such as supporting fisheries, regulating climate through carbon sequestration, and offering coastal protection. Despite their ecological importance, seagrass meadows are in decline globally due to human activities in coastal areas and climate-related stressors, with particularly alarming rates of loss in the Indo-Pacific, a region known for its high seagrass diversity and distribution.

This PhD research investigated the reproductive strategies and population connectivity of seagrasses in the Indo-Pacific bioregion. By understanding these processes, this work aims to enhance conservation efforts and inform management strategies for seagrass ecosystems. Fieldwork was conducted across Southeast Asia (Thailand, Vietnam, Malaysia, and the Philippines) and Micronesia (Guam and Saipan). Genetic markers were used to study reproductive strategies among and within seagrass species, and across environmental conditions. Furthermore, we combined genetic analyses with a high-resolution ocean model to investigate connectivity between populations, and to assess the role of contemporary surface ocean currents for seagrass dispersal.

We revealed strong differences in the balance between sexual and asexual reproduction and clonal structure among seagrass species. Moreover, we observed substantial variation in reproductive strategy within species, influenced by human disturbance and geographic isolation. Among the highlights was the discovery of a millennia-old seagrass clone, the oldest and largest recorded in the Indo-Pacific bioregion. We show that local population connectivity is strongly shaped by ocean currents, with connectivity strength varying among species due to differences in dispersal traits. In contrast, regional connectivity was weak.

Our findings emphasize the need for protection and restoration strategies tailored to the reproductive and dispersal traits of individual seagrass species, and in some cases, to specific populations. This work also provides important insights for improving marine spatial planning and the design of marine protected areas in the Indo-Pacific.