The University of Hong Kong
School of Biological Sciences

Qualifying Seminar

Drivers of Biodiversity and Ecological Function in Regenerating Forests in Hong Kong

Date: 30/09/2022

Time: 11:30

Venue: Zoom

About the speaker:

Coşkun Güçlü is a PhD student in Dr Louise Amy Ashton's Biodiversity and Environmental Change Lab. He is interested in assessing the efficacy of different ecological restoration practices through the lens of community assembly. During his PhD, he aims to investigate the ecological consequences of different restoration approaches at multiple levels in Hong Kong forests, ranging from, plant and invertebrate species diversity, intraspecific mycorrhizal population genetic structure, and ecosystem functions.

Abstract:

Secondary forests represent a significant proportion of global forests, with over 65% of Asian forests classified as non-primary. As remaining primary forests become disturbed, finding effective ways to restore forests to maximize biodiversity and ecosystem functions will be important for the provision of ecosystems services. This necessitates the study of community assembly and biodiversity ecological function relationships under different forest regeneration scenarios. My thesis opens by assessing forest tree community assembly in response to forest age during secondary succession in Hong Kong. While tree species alpha diversity indicates species compositional and successional changes, beta diversity and subcomponents of Turnover and Nestedness reveal community assembly mechanisms driving secondary succession in passively regenerating forests. Plant survey data were analyzed for Sorenson, Simpsons and Nestedness diversity metrics. Forest stand age (years), elevation (metres) and inter-plot distance (metres) were used to model beta-diversity metrics. Total Beta-diversity and Nestedness were most significantly predicted by forest age, while Elevation most significantly predicted Turnover. Nestedness patterns indicted dispersal limited succession. The next part of my thesis will compare species compositional changes between passively regenerating forests, and actively replanted forests in Hong Kong to assess the consequences for different aspects of community assembly and ecological function. Firstly, soil microbial, mycorrhizal and invertebrate diversity and carbon fluxes will be measured in passively and actively restored forests to assess the community assembly and ecological functional consequences of restoration strategies. Next, the impacts of different restoration initiatives for mycorrhizal population genetic structure will be assessed, to determine the eco-evolutionary impacts of different restoration strategies.