



University of Cyprus  
Department of Biological  
Sciences

*Ph.D. Thesis Defense*

# *Student Presentation*

Friday, 27 May 2022 at 10:00

*This seminar is open to the public via Zoom*

<https://ucy.zoom.us/j/98395270572?pwd=UWt2WEVzYUVVUEk1aTVqUWNRUHM2Zz09>

Meeting ID: 983 9527 0572

Passcode: 918409

**Fyttis C. Georgios**

*Thesis Supervisor: Prof. Spyros Sfenthourakis*

## **“Community structure and composition, spatial and temporal variability, and phenology of mesozooplankton in the coastal waters of Cyprus (eastern Levantine)”**

Mesozooplankton (MZ) species play a critical role in the carbon-flow processes through their interactions with higher and lower trophic levels within the water column, and/or with the benthic community, and occupy a key position in the coastal and pelagic food webs. Monitoring of coastal MZ communities' dynamics helps us to understand the function of coastal ecosystems, particularly energy transfer from primary producers to higher trophic levels. This research provides, for the first time, information on the spatio-temporal variations of MZ in the coastal waters of Cyprus in terms of abundance, biomass, composition, body-size, respiration rates through Electron Transport System (ETS), and their relations to the physical structure, nutrient regime, and Chl-a concentrations of the sampling locations at Akrotiri (AKR), Kato Pyrgos (PYR), and Vasiliko (VAS1 and VAS2). Sampling took place on monthly basis, in a complete year cycle. In terms of physical attributes of the study areas, four months of sharp vertical mixing in all stations from January to April was observed whereas stratification of the water column started in mid-spring and continued throughout the year until December. Temperatures surpassed 29 °C during summer and salinity was very high (>39) all over the year. Nutrient regime didn't exhibit a clear pattern and their concentration in the coastal waters of Cyprus was in general low, with some exceptionally

high values of phosphate concentration in winter, spring and autumn, possibly due to localised sources of nutrient inputs. The extremely low Chl-a concentrations recorded in the study area reflect the ultra-oligotrophic conditions of the eastern Mediterranean (Levantine basin). This study recorded in total 194 taxa of MZ, 146 taxa of which were copepods identified through an intensive taxonomic work. The MZ distribution and community structure in coastal waters of Cyprus are influenced by stratification, temperature and Chl-a. The combination of upwelling and advection from the Rhodes Gyre, evident during the summer and causing cooler waters at the near-surface layers in the southern coast of Cyprus, seems to control the food supply, hence offers favourable feeding conditions to zooplankton organisms, enhancing their numbers. The higher abundance of MZ in the southern stations (AKR, VAS1 and VAS2) during summer, compared to the northern station (PYR), is attributed to this upwelling. The proximity of VAS1 to a fish-farm also seems to increase the abundance of MZ in this station. Electron transport system specific activity (spETS) and respiration rates exhibited low values compare to other areas in the Mediterranean. Temperature and body-size seem to be the parameters that influence the correlations of spETS and respiration rates with specific groups of MZ. The dataset of body-size measurements created in this study constitutes the stepping stone to a better appreciation on MZ community size-structure in the coastal waters of Cyprus. This study also reveals the importance of smaller species and copepodites in the composition, structure, and functionality of Cyprus coastal waters' copepod community. This baseline study paves the way for further investigation of the elements of marine food webs through a future long-term monitoring. Such future work will be paramount for developing a better understanding of zooplankton dynamics and phenology in the coastal waters of Cyprus and Levantine basin in general.