



*Ph.D. Thesis Defense*

*Student Presentation*

**Monday, 18 December 2023 at 11:00**  
**Building XΩΔ 01, Room 003, Panepistimioupoli Campus**

*This seminar is open to the public*

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**“PATTERNS OF ENDEMISM AND COLONIZATION  
DYNAMICS OF BREEDING BIRDS OF CYPRUS AND CRETE”**

Unveiling the factors that shape and regulate diversity in species richness in relatively simple systems such as islands is a fundamental step to understand species' global distribution. Moreover, the high frequency of endemism on islands has long attracted the attention of conservation practitioners, thus making the study of the mechanisms that drive and maintain island diversity compelling. Because of their isolation from the mainland as well as peculiar environmental conditions, islands have often provided excellent opportunities to investigate factors influencing genetic variation, such as the demographic history of island lineages, and therefore to examine the processes of population differentiation and speciation.

The demographic histories of island populations are influenced by the time of colonization, population size fluctuations, and connectivity with nearby populations. Moreover, the demographic history of a species is characterized by a series of historical and ongoing events, such as the emergence of land bridges or mountain ranges, glacial maxima affecting the extent of ice sheets and the active dispersal of populations into new habitats. In these regards, the Mediterranean region presents an excellent study site to investigate the demographic history of island populations. The Mediterranean Basin is filled with islands and stands out as a region characterized by an extraordinary level of genetic and species diversity both of flora and fauna and it is recognized as a Global Biodiversity Hotspot. Specifically, Cyprus and Crete are the largest islands in the eastern Mediterranean region in which there are several endemic bird species

and subspecies, thus making them two ideal candidate sites to investigate the processes of avian diversification from mainland populations.

For my Ph.D., I investigated patterns of endemism and colonization dynamics of breeding birds of Cyprus and Crete. In the study described in Chapter 2, I explored the comparative levels of genetic divergence and population structure among several species of birds (*Certhia brachydactyla*, *Parus major*, *Troglodytes troglodytes*, *Turdus merula*, *Fringilla coelebs* and *Sylvia melanocephala*) in insular and continental populations and found evidence of population structure and genetic differentiation across a range of species. In Chapter 3, I investigated the regional colonization dynamics and demographic history of four species (*Certhia brachydactyla*, *Parus major*, *Turdus merula* and *Fringilla coelebs*) with breeding populations in Cyprus and Crete and found that the two islands were colonized by different mainland populations. I found support for the colonization of Cyprus and Crete by both *T. merula* and *P. major* around the same period. Following on, in Chapter 4 I examined the demographic history and colonization dynamics of Cyprus Wheatear *Oenanthe cypriaca*, an endemic species in Cyprus, as well as the demographic history of *O. melanoleuca* in Crete and compared the colonization history of *Oenanthe* to Crete and Cyprus. I found that *O. cypriaca* colonized Cyprus ~150,000 ya while colonization of Crete by *O. melanoleuca* came much later ~13,000 ya after the last glacial maximum. Overall, my thesis research suggests that historical events, such as glacial and interglacial periods, as well as species-specific characteristics, such as dispersal ability, can play an important role in the colonization patterns of an island and the demographic history and genetic diversity of a species.