



Bellati Adriana, Rocco Tiberti, Walter Cocca, Andrea Galimberti, Maurizio Casiraghi, Giuseppe Bogliani, Paolo Galeotti. 2014. A dark shell hiding large variability: a molecular insight into the evolution and conservation of melanic *Daphnia* populations in the Alps. *Zoological Journal of the Linnean Society*, 171: 697-715

Zooplanktonic microcrustaceans of the *Daphnia pulex* group appear highly differentiated at high altitudes as a result of alternative colonizations and quick local adaptation to harsh environments. In particular, the occurrence of deeply differentiated mountain lineages of European *Daphnia pulicaria* (EuPC) is highly related to glacial advances and retreats during the Pleistocene. Nowadays, one single ancient EuPC lineage survives in the Pyrenees, with another inhabiting the High Tatra Mountains. Much less is known about populations inhabiting the Alps, where EuPC populations are extremely rare. Recently, four new melanic populations have been discovered in lakes in the Western Italian Alps, offering the opportunity to study their origin and adaptations. We inferred phylogenetic relationships of melanic high-mountain populations in order to disentangle their history and clarify the colonization patterns of alpine populations. Molecular data Ecological impact of introduced fish in high altitude lakes: a case of study from the European Alps suggest that dark populations originated from at least two ancestors, one genetically close to boreal haplotypes, the other apparently related to refugial populations that survived in southern Europe. Therefore, dark pigmentation and obligate parthenogenesis evolved independently within both lineages inhabiting the studied lakes as extreme local adaptations to the alpine environment. Finally, since impacts of human-related activities and climate changes on mountain species are known to be dramatic, we pose strong issues for the conservation of these extremely localized endemisms.