

Altitudinal gradient creates favorable system for research of populations from different altitudes and the influence of both neutral evolutionary processes and local conditions on their genetic structure. Adaptation of different genotypes to the local conditions is generally attributed to clinal variability of genetically determined features and geographic variation of phenotypes in populations. Thanks to their different adaptations to specific environments, genetic drift and possibly limited gene flow, populations can show significant variability that may lead to speciation events. Altitude represents selective pressure for organisms primarily due to reduced partial oxygen pressure, lowered temperature and increased exposure to UV light. Genetic differences created due to location of the population on altitude gradient can be evaluated based on the nature of climate change. There is strong evidence for the importance of altitude adaptations at molecular level for certain key genes, particularly for hemoglobin and mitochondrial genes.