

Abstract

The work summarizes current knowledge about the melanin-based color polymorphism of integument and its relation to other phenotypic traits in vertebrates. The melanin coloration is the most common type of integument pigment coloration. The biochemical pathway for melanin pigment production can be affected by both genes and environment, which results in coloration polymorphism on intraspecific and interspecific level. The melanocortin system is regulated by genes with pleiotropic activity. Through this pleiotropy the melanin coloration is linked with a number of physiological, morphological and behavioral traits. The work describes the mechanisms of color polymorphism development and the adaptive functions of polymorphism (energy homeostasis, thermoregulation, immune response, resistance to stress and parasites, crypsis). It compares the differences between dark- and lightcolored individuals at intraspecific level: variability in phenotype and in behavior (dark color is generally associated with greater aggression, dominance, sexual activity or exploration rate). Many studies suggest the advantageousness of the dark melanin coloration. So the question remains, why the majority of vertebrates is rather lightcolor.

Keywords: melanin , pheomelanin, eumelanin, Melanocortin 1 receptor, MC1R , Agouti signalling peptide, ASIP , pleiotropy, melanocortin system, color polymorphism