

Abstract

Antimicrobial proteins contained in the albumen represent maternal effects, including the non-genetic component allocated into the egg during its oogenesis. Especially for species, whose broods are exposed to environmental influences until completion, these proteins play a crucial role in the viability of embryos due to their potential to influence the risk of microbial infection, which is considered one of the main causes of reduced hatchability. Also, it is assumed that these proteins, because of their specific traits, may influence phenotype of chicks, especially its size and immunity in the early postembryonal stage.

In my thesis I focused on three antimicrobial proteins of avian egg white - avidin, lysozyme and ovotransferrin, which vary in their antimicrobial activity. For a better understanding of causal relationships between the concentrations of these proteins in the albumen and their effect on hatching success or offspring phenotype, a series of manipulation experiments and correlative measurements were performed. These experiments were held on the eggs of two precocial species - Japanese Quail (*Coturnix japonica*) and Mallard (*Anas platyrhynchos*).

Our results indicate a crucial role of antimicrobial proteins in reducing the risk of bacterial infection and their natural concentration also increased hatching success. Direct effect of experimentally increased concentrations of avidin and lysozyme in egg white on morphometric parameters of chicks was not observed. However, the results indicate that especially avidin may cause changes in embryogenesis, reflected by a different time period of hatching and changes in non-specific immune response.

Keywords

maternal effects, antimicrobial proteins, avidin, lysozyme, ovotransferrin, birds, hatchability, phenotype, immune system