015-LIPS

An Investigation on Embryonic Development Diapause

Abstract:
Diapause, often as an adaptive response to unfavorable environmental conditions, is a period of suspended development and reduced metabolic activity in certain embryos. Embryonic diapause is a reproductive strategy in birds and mammals. It is influenced by various factors such as environment and physiological signals. In chickens, diapause occurs when the egg's temperature drops rapidly to match the environment, pauses development, and then resumes when the temperature rises. The temperature has a major role in biological systems at all lengths and timeframes (days and times). The changes in temperature can impact cells and the enzymes that make them up and volume expansion, protein folding, and the molecular makeup of cells. In this study, forty fertilized eggs were divided into four groups (n=10). The eggs were incubated at four temperature levels: 12°C (diapause control), 27.5°C, 32.5°C, and 37.5°C (normal incubation control), then examined for viability and developmental status. After incubation for 5 days, the normal incubation control group had eight eggs developed to stage 25 while the two groups incubated at 27.5°C and 32.5°C had delayed development ($p < 0.00001$). The group kept at 12°C did not have further development. This study shows that temperature has a major effect on embryo diapause and development.