Visible Light and Its Influence on the Embryonic Viability of the Cricket Acheta domesticus

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During in vitro fertilization (IVF) human embryos are incubated without light, and these conditions do not ensure embryo survival. In this study, I explore whether environmental conditions can influence the embryo viability rates of the house cricket, Acheta domesticus. In particular, I have tested what colors of visible light provide the best incubation conditions to ensure cricket embryo viability. My concept was to use house cricket embryos to represent human embryos. Cricket embryos were chosen as their eggs have soft outer membrane casings and resemble human embryos during the first few days after fertilization. During the experiment, the adult crickets laid their eggs into one of six soil filled boxes called substrates. Each substrate was placed into one of six storage containers filled with adult crickets and lit with a different colored visible light (red, yellow, green, blue, white, or no light). After two days of breeding, the egg-filled substrates were removed from the adult crickets and placed in another storage container of the same color light. After incubation under heat emitting lamps and under one of six light colors, nymphs were counted after hatching to determine the embryo viability. After three trials, the red light provided the significantly highest viability rate, with yellow and no light being comparable seconds. The green, blue, and white lights showed significantly lower viability rates than no visible light. My results raise the speculation that exposing fertilized mammal eggs to visible light colors might have the same effects during the IVF process.

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