

Early life exposure to artificial light at night affects the physiological condition: An experimental study on the ecophysiology of free-living nestling songbirds

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Light pollution or artificial light at night (ALAN) is an increasingly important anthropogenic environmental pressure on wildlife, affecting animal behaviour and physiology. Since early life experiences produce effects that can persist throughout life, light exposure during development may have profound effects. Here, we experimentally investigated for the first time the impact of ALAN on body mass, and other important physiological indicators of immunity, health, and physiological condition, using nestlings of a free-living songbird, the great tit (*Parus major*). Body mass, haptoglobin, nitric oxide and multiple metrics of both oxidative damage and antioxidant defences were determined at baseline (13 days after hatching) and again after a two night exposure to ALAN. Light exposed nestlings showed no increase in body mass, in contrast to unexposed individuals. Furthermore, ALAN increased haptoglobin while decreasing nitric oxide. There were no effects on any of the oxidative status parameters. Our study provides rare experimental field evidence that ALAN negatively affects free-living nestlings' development, which could have adverse consequences lasting throughout adulthood.

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