La radiación ultravioleta no aumenta el estrés oxidativo en la lagartija *Psammodromus algirus* a lo largo de un gradiente altitudinal

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Los lacértidos, por su condición de ectotermos, pasan bastante tiempo expuestos al sol para termorregular. Como consecuencia de ello, se encuentran expuestos a la radiación ultravioleta (UV) (λ = 280-400 nm) procedente del sol, que por otro lado, es uno de los componentes más dañinos de la luz solar. La radiación UV causa numerosos daños en el organismo, desde daños a nivel molecular hasta daños a nivel de tejidos, incluso puede causar la muerte en algunos organismos. La fotooxidación de las biomoléculas produce radicales libres, que pueden oxidar otras moléculas del organismo. Cuando la maquinaria antioxidante no es capaz de combatir la acción de estos radicales libres, en el organismo se produce una situación de estrés oxidativo. Dado que la radiación UV aumenta en intensidad conforme ascendemos en altitud, nuestra hipótesis predice que los lacértidos procedentes de altitudes más elevadas deberían estar mejor adaptados a estas condiciones de alta radiación UV, que los lacértidos de altitudes bajas.

En este trabajo, comprobamos esta hipótesis en la lagartija colilarga (*Psammodromus algirus*) a lo largo de un gradiente altitudinal (6 localidades, desde los 300 hasta los 2500 m sobre el nivel del mar). Durante un experimento de laboratorio, las lagartijas procedentes de cada localidad estuvieron expuestas 5 horas a condiciones de radiación UV (grupo experimental, bombilla de luz UV) o de luz fotosintéticamente activa (grupo control, bombilla de luz blanca). 24 horas después de la exposición, se cogieron muestras de tejido de la cola. Como indicadores del estrés oxidativo, medimos el daño oxidativo (hidro-peroxidación de lípidos y proteínas) y la capacidad antioxidante (a nivel enzimático y no enzimático). Como resultado, no encontramos diferencias en los niveles de estrés oxidativo entre los tratamientos; sin embargo, encontramos que el daño oxidativo fue menor en los individuos procedentes de mayores altitudes. Con esto, concluimos que la radiación ultravioleta no es un agente oxidante para *P. algirus*. Coincidiendo con un trabajo previo, nuestros resultados sugieren que el ambiente de altitudes bajas es más oxidante para las lagartijas. Por lo tanto, *P. algirus* está bien adaptada a ocupar un amplio rango de altitudes, lo que podría favorecer a la especie en el caso de la necesidad de tener que ascender en altitud, en un escenario de calentamiento climático.

Ultraviolet radiation does not increase oxidative stress in the lizard *Psammodromus algirus* along an elevational gradient

Lizards, as ectotherms, spend much time thermoregulating. Consequently, they are subjected to ultraviolet (UV) radiation (λ = 280-400 nm) from the sun, which is the most harmful component of solar radiation spectrum. UV-radiation can cause several damages from molecular to tissue level, or even the death in several organisms. Photooxidation provoked by UV-radiation produces reactive oxidative species (ROS). When antioxidant machinery cannot combat ROS concentration, oxidative stress occurs in the organisms. Given that UV-radiation increases with elevation, we hypothesized that lizards from high elevations should be better adapted against UV-radiation than lizards from lower elevations.

In this work, we test this hypothesis in Large Psammodromus (*Psammodromus algirus*) along an elevation gradient (six localities, from 300 to 2500 m above sea level). We ran an experimental process in which lizards from each locality were exposed to 5-hour doses of UV-radiation (UV-light bulb, experimental group) or photosynthetically active radiation (white-light bulb, control group), and 24 h after the exposition we took tissue samples from the tail. We measured oxidative damage (lipid and protein peroxidation) and antioxidant capacity (enzymatic and non-enzymatic) as oxidative stress biomarkers. We did not find differences in oxidative stress between treatments. However, we found that oxidative damage was smaller in lizards from highlands, and thereby we conclude that UV-radiation is not a stressor agent for *P. algirus*. Matching with a previous work, our findings suggest that lowland environment is more oxidative to lizards. Therefore, *P. algirus* is well adapted to inhabit a wide elevation range, and this probably will favour the lizard in case it ascends as consequence of climate warming.

Elevational gradient, global warming, lacertids, oxidative stress, *Psammodromus algirus*.

Consequences of corticosterone-mediated sexual conflict in common lizards (*Zootoca vivipara*)

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Frequently, males and females show different optimal fitness strategies concerning the system and frequency of mating, giving rise to sexual conflict. The outcome of this sexual conflict is determined by the balance between the costs and benefits of mating for each sex and proves essential in the evolution of reproductive strategies that can lead to speciation. Stress is a common response during reproductive events. It affects a diverse range of behavioural interactions, including mating, and oftentimes it negatively affects female fecundity and offspring quality. Asymmetric (sex-specific) effects of stress may influence the balance of costs and benefits of mating and thereby alter sexual conflict resolution.

Common lizards (*Zootoca vivipara*) exhibit a polygynandrous mating system in which males possess higher potential rate of reproduction than females, their fitness (i.e. number of offspring) largely depending on the number of mates they can fertilize. Females' potential reproductive rate is lower and they exhibit stronger mate discrimination. Their offspring do not increase proportionally with the number of mates and their lifetime fitness may be affected by current reproductive investment. In a mating experiment, we used corticosterone, one of the main glucocorticoid hormones involved in the stress response of lizards, to investigate female mating behaviour under high blood corticosterone levels and thereby assess the effects of increased asymmetric costs of mating in sexual conflict resolution. Since multiple paternity is common in the wild, we presented females with at least two different partners (either known or novel). This allowed us to further explore the hypothesis that high corticosterone level females might use multiple mating as a mechanism to compensate their higher costs of mating through increased genetic diversity, viability or sexual attractiveness of their offspring (i.e. potential benefits). Results revealed that high corticosterone level females were more aggressive towards conspecifics, especially males and known partners. They showed reduced probability of copulation compared to control females and this response was size-dependent. In contrast, males showed very similar behaviour towards females from different corticosterone group. Regardless of male increased interest towards known females, the probability of copulation between different groups of partner novelty was unchanged. Furthermore, copulations were longer on average with novel females, implying an increased chance of fertilization. Our results are consistent with the hypothesis that females try to reduce (rather than compensate) the elevated costs of mating through stronger mate discrimination, favouring long-term reproductive success over current attempts. This suggests an important, potential impact of environmental sources of stress during breeding in the evolution of reproductive strategies.

Sexual conflict, female choice, stress, multiple mating, mating behaviour, lizard.