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How Climate Change Might Impact on Xenarhtra Species?

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Editorial

Global warming is on track to exceed the agreed-upon limit of 1.5°C for this century [1]. Climate change has many effects on animal populations, which includes modification in abundance, distribution range, morphology and behavior [2,3]. Although few studies focus on the impact of climate change on the life stories of species, Pacifici, et al. [4] found that a large number of species have been affected, at least in terms of their range. Additionally, they discovered that 47% of threatened mammals have already experienced negative impacts from climate change. Extrinsic factors, such as extreme temperature changes or changes in rainfall, can influence activity patterns, behavior, and space use by mammals as adaptive short-term responses [5].

The superorder Xenarthra includes sloths, anteaters and armadillos, a south America endemic group with 31 living species [6]sloths, and anteaters. This group of mammals has a low rate of heat production, low body temperature and high sensitivity to environmental temperature changes which results in low capacity for physiological thermoregulation [7]. Among the 31 species, five are listed as Near Threatened and five are included in the threatened category [8], the main threats they face include hunting by humans, habitat fragmentation, and road-killing [9]. In this context, how might climate change impact on wild populations of xenarthrans in the near future?

In comparison to other placental mammals, xenarthrans demonstrate a high plasticity to adjust their behavior in response to changes in environmental temperature due to their limited capacity for physiological thermoregulation [10,11]. The combination of increased occurrences of extreme temperature events, high levels of precipitation, and other threats that xenarthrans face, could have a significant impact on wild populations in several ways.

Anteaters (Xenarthra: Pilosa) use vegetation as thermal shelter. Camilo-Alves, et al. [12] and Giroux, et al. [13] found that the giant anteater (*Myrmecophaga tridactyla*) select forest to rest during hot hours. But the presence of fragmented landscapes and reduced availability of forest patches could negatively impact the thermoregulation of giant anteaters [13].

On the other hand, armadillos (Xenarthra: Cingulata) are semifosorial mammals that construct burrows as shelter, using these structures to regulate their body temperature during extreme hot or cold hours. But some species of this order are highly influenced by precipitations level. For example, precipitation is a climate variable that determines the potential distribution for species of the Dasypus genus, along with the armadillo species *Euphractus sexicinctus*, which is not adapted to dry environments [14]. However, species of the Euphractinae subfamily (Family: Chlamyphoridae), such as *Zaedyus pichiy*, *Chaetophractus villosus*, and *C. vellerosus*, have evolved in semiarid climates [14]. Also, armadillos are known to avoid flooded areas [14-16]. If climate change leads to an increase in flooding events, it will have a negative impact on the activity of armadillos across a significant portion of their distribution.

Extreme climate events will facilitate the proliferation of pathogens among wild mammal populations. Miranda, et al. [17] documented the occurrence of *Leptospira interrogans* in giant anteaters as a result of the favorable conditions for the survival of this pathogen, including abnormal high temperatures, flooding, and increased humidity levels.

Furthermore, Superina, et al. [18] recorded an opportunistic bacteria that caused a skin infection in *Zaedyus pichiy*, seemingly associated with extreme precipitation events, resulting in localized lesions in this armadillo species.

In conclusion, climate change poses a significant and multifaceted threat to Xenarthra species. With their limited capacity for physiological thermoregulation and specific habitat requirements, these mammals are already facing challenges from human activities such as habitat fragmentation and hunting. The changing climatic conditions, including extreme temperature events, altered precipitation patterns, and increased pathogen proliferation, further exacerbate the vulnerabilities of Xenarthra populations. Filling the knowledge gaps and taking proactive measures are needed to mitigate the impact of climate change on these species and their habitats. This can be achieved through initiatives such as establishing priority areas for conservation, habitat preservation, restoration, among others. By understanding and addressing the complex interactions between climate change, species biology, and ecological dynamics, we can work towards ensuring the long-term survival and well-being of Xenarthra species in a changing world.

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