8.3 Future research directions in reptile conservation

Future research should focus on addressing knowledge gaps and improving conservation methodologies. Environmental DNA (eDNA) offers a promising tool for detecting elusive species and measuring community diversity, which can be particularly valuable for reptiles (Nordstrom et al., 2022). Additionally, research should prioritize understanding the impacts of global climate change on reptile distributions, as over half of reptile species are experiencing range contractions due to climate change (Li et al., 2024). Studies should also explore the influence of species traits on population responses to environmental disturbances, which can guide conservation efforts by identifying species at higher risk (Hu et al., 2020). Expanding research to underrepresented regions and taxa will be essential for developing comprehensive conservation strategies.

8.4 Final remarks on the integration of scientific insights into practical conservation

Integrating scientific insights into practical conservation is vital for the effective protection of reptiles. This involves not only addressing current knowledge gaps but also applying innovative tools and methodologies to conservation practices. By leveraging advances in ecological and evolutionary research, conservation programs can be more adaptive and responsive to the needs of reptile species. Ultimately, a concerted effort to integrate these insights will enhance the resilience of reptile populations and contribute to the broader goal of biodiversity conservation.

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Conflict of Interest Disclosure

The authors affirm that this research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

References

Anslan S., Dalgo D., Reinhardt T., Peñafiel N., Guayasamin J., Páez-Rosas D., Vences M., and Steinfartz S., 2021, DNA metabarcoding reveals fine scale geographical differences of consumed algae in the Galápagos marine iguanas (*Amblyrhynchus cristatus*), Amphibia-Reptilia, 42(4): 471-480.
https://doi.org/10.1163/15685381-bja10070

Araya-Donoso R., Juan S., Tamburrino Í., Lamborot M., Veloso C., and Véliz D., 2021, Integrating genetics, physiology, and morphology to study desert adaptation in a lizard species, Journal of Animal Ecology, 91(6): 1148-1162.
https://doi.org/10.1111/1365-2656.13546

Blais B., Wells S., Poynter B., Harris T., Allard R., and Koprowski J., 2022, Bridging conservation across the ex situ–in situ spectrum: insights into the reproductive ecology of the threatened narrow-headed gartersnake (*Thamnophis rufipunctatus*), Zoo Biology, 42(3): 429-439.
https://doi.org/10.1002/zoo.21747

Brum P., Gonçalves S., Strüssmann C., and Teixido A., 2022, A global assessment of research on urban ecology of reptiles: patterns, gaps and future directions, Animal Conservation, 26(1): 1-13.
https://doi.org/10.1111/acv.12799

Burriel-Carranza B., Tejero-Cicuéndez H., Carné A., Mochales-Riaño G., Talavera A., Saadi S., Els J., Šmíd J., Tamar K., Tarroso P., and Carranza S., 2024, Integrating genomics and biogeography to unravel the origin of a mountain biota: the case of a reptile endemicity hotspot in Arabia, Systematic Biology, 74(2): 230-249.
https://doi.org/10.1093/sysbio/syae032

De Miranda E., 2017, The plight of reptiles as ecological actors in the tropics, Frontiers in Ecology and Evolution, 5: 159.
https://doi.org/10.3389/fevo.2017.00159

Derry A., Fraser D., Brady S., Astorg L., Lawrence E., Martin G., Matte J., Dastis J., Paccard A., Barrett R., Chapman L., Lane J., Ballas C., Close M., and Crispo E., 2019, Conservation through the lens of (mal)adaptation: concepts and meta-analysis, Evolutionary Applications, 12: 1287-1304.
https://doi.org/10.1111/eva.12791

Dewoody J., Harder A., Mathur S., and Willoughby J., 2021, The long-standing significance of genetic diversity in conservation, Molecular Ecology, 30: 4147-4154.
https://doi.org/10.1111/mec.16051

Dodge T., Farquharson K., Ford C., Cavanagh L., Schubert K., Schumer M., Belov K., and Hogg C., 2023, Genomes of two extinct-in-the-wild reptiles from Christmas Island reveal distinct evolutionary histories and conservation insights, Molecular Ecology Resources, 25(5): e13780.
https://doi.org/10.1111/1755-0998.13780