

A SCENT TO TRIGGER MATING IN ENDANGERED LEMURS

Emily Elwell 1519505, Supervisors Dr Stefano Vaglio, Dr Stefano Kaburu and Dr Chris Young

Message Scent

- Lemurs use scents to communicate with each other¹. Scents provide information on sex, age, identity, social and reproductive status¹.
- Zoos play an important role in lemur conservation through breeding programmes².
- Zoos use environmental enrichment (objects and activities) to create stimulating environments to improve both the well-being of their animals².
- Links between enrichment and breeding success is poorly understood, but there is some promising evidence³.
- Ruffed lemurs are critically endangered and breeding programmes essential for their survival^{4,5}.
- Can we make a female fertile lemur scent in the lab to trigger mating?



Introducing the Scent

- Pilot study took place July-August 2021.
- Study periods:



- Cotton soaked in the scent mixture was hung around enclosures.
- Scan sampling for mating behaviours⁶.
- Testing for testosterone concentration in male faeces.



Scent-sational Results

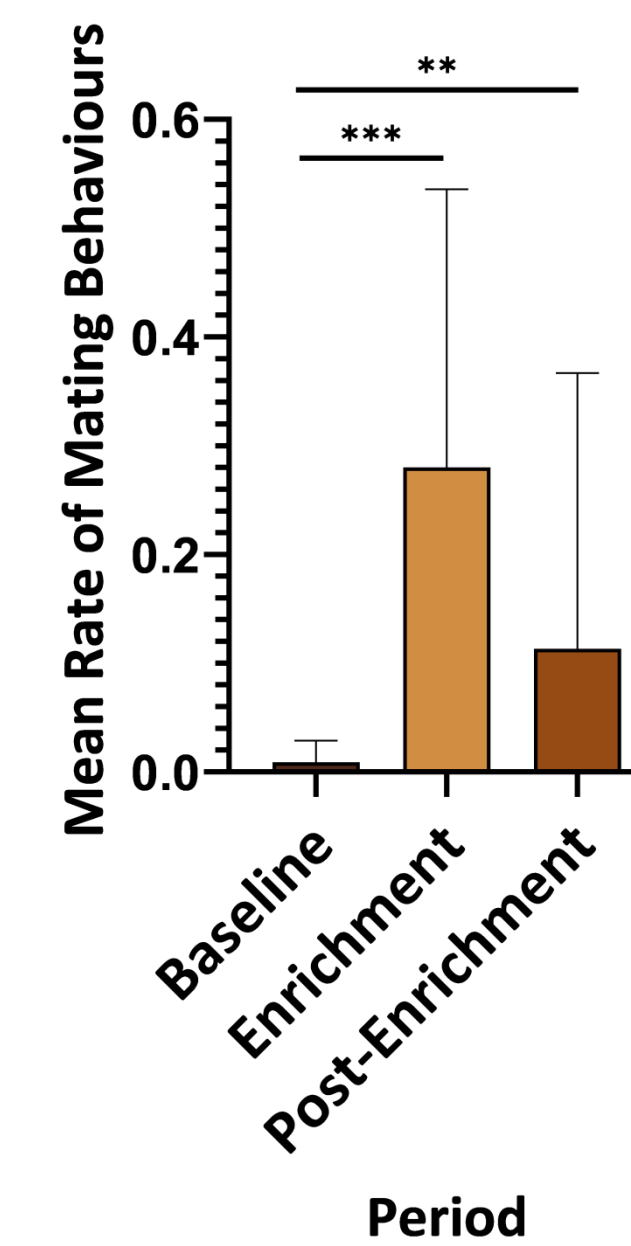


Figure 1: Males increased their breeding behaviours significantly during (***) and after (***) the scent enrichment compared to the baseline.

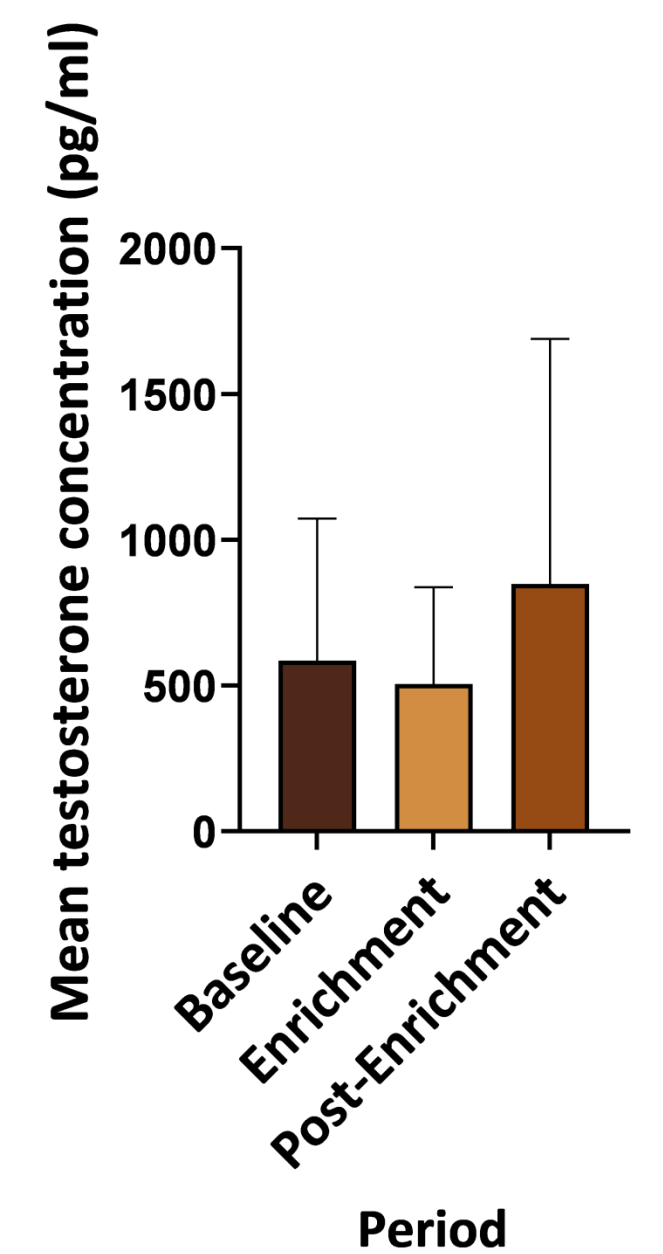


Figure 2: Mean concentrations of testosterone in male (n= 5) faeces did not increase significantly after scent exposure.

What's in a Lemur Scent?

- Scents collected by a vet from a female (in breeding and non-breeding season).
- Analysed using gas-chromatography mass-spectrometry.
- Total of 12 compounds identified as important to breeding season.
- These 7 were used for a pilot study:

Compound Name	Class
1-Octanol	Alcohol
2-Phenyl-2-propanol	Alcohol
2-Phenoxyethanol	Ether
Nonanal	Aldehyde
Decanal	Aldehyde
Dihydromyrcenol	Terpenoid
Tetrahydrolinalool	Alcohol

Meet the Lemurs

- 3 study groups:



Twycross Zoo
Red-ruffed lemur
(*V. rubra*)
1 ♂ + 1 ♀



Dudley Zoo
Black-and-white-ruffed lemur
(*V. variegata*)
1 ♂ + 2 ♀



Dudley Zoo
Black-and-white-ruffed lemur
4 ♂

References

¹Wackermannová, M., Pinc, L. and Jebavý, L. (2016) Olfactory Sensitivity in Mammalian Species. *Physiological Research*, **65**, pp. 369 – 390. ²Shapiro, M. E., Shapiro, H. G. and Ehmke, E. E. (2018) Behavioural responses of three lemur species to different food enrichment devices. *Zoo Biology*, **37**, pp. 146–155. ³Carlstead, K. and Shepherdson, D. (1994) Effects of Environmental Enrichment on Reproduction. *Zoo Biology*, **13**, pp. 447–458. ⁴Borgerson, C., Eppley, T.M., Patel, E., Johnson, S., Louis, E.E. & Razafindramanana, J. 2020. *Varecia rubra*. *The IUCN Red List of Threatened Species* 2020: e.T22920A115574598. ⁵Louis, E.E., Sefczek, T.M., Raharivololona, B., King, T., Morelli, T.L. & Baden, A. 2020. *Varecia variegata*. *The IUCN Red List of Threatened Species* 2020: e.T22918A115574178. ⁶Altmann, J. (1974) Observational Study of Behaviour: Sampling Methods. *Behaviour*, **49** (3), pp. 227–267.