Dog Appeasing Pheromone prevents the testosterone surge, and may reduce contact-dominance and active-submission behaviours after interventions in captive African wild dogs (*Lycaon pictus*).

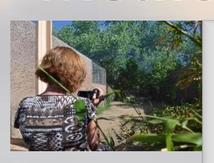
F. Van den Berghe[1,2], M.C.J. Paris[1,2,3], Z. Sarnyai[1], R. Millar[2,4], A. Ganswindt[5], A. Cozzi[6], P. Pageat[6] & D.B.P. Paris[1]

[1]College of Public Health, Medical and Veterinary Sciences, James Cook University, Townsville, QLD, Australia
[2]Institute for Breeding Rare and Endangered African Mammals, Edinburgh, UK
[3]Wageningen Livestock Research, Wageningen, The Netherlands
[4]Mammal Research Institute, University of Pretoria, Pretoria, South Africa
[5]Department of Anatomy and Physiology, Faculty of Veterinary Science, University of Pretoria, South Africa
[6]Institut de Recherche en Sémiochimie et Ethologie Appliquée, Apt, France

Introduction

African wild dogs (AWD; *Lycaon pictus*) have a complex hierarchical social structure that can lead to aggression, morbidity & mortality after temporary separation of individuals from the pack, or during new pack formations. We performed a placebo controlled double-blinded study to evaluate the effect of Dog Appeasing Pheromones (DAP) on faecal glucocorticoid (fGCM) & testosterone (fAM) metabolites, & behaviour in captive African wild dogs, after temporary pack separation, immobilisation & reintroduction.

Methods



Behavioural observations
- Non-contact & contact dominance behaviour
- Active & passive submission
- Aggressive behaviour
- Affiliative behaviour

Individual faecal sample collection & hormonal analysis
- Cortisol-3-CMO (fGCM)
- T-3-CMO (fAM)

-3 -2 -1 0 +1 +2 +3 +4 +5 Days

Anaesthetic intervention for reproductive study

Blind Trial:
Topical application of 10 ml:

Zoo	*DAP*	*PLACEBO*	*Pack composition*
BIN	Jul 2014 (n=3 ♂)	Sept 2014 (n=3 ♂)	3 ♂
TOP	May 2014 (n=3 ♂)	-	3 ♂
OKC	-	Sept 2014 (n=3 ♂)	3 ♂, 1 ♀
ABQ	Aug 2014 (n=3 ♂)	May 2014 (n=3 ♂)	3 ♂
BRK*	Aug 2014 (n=3 ♂)	Jun 2014 (n=2 ♂)	3 ♂, in August 1 ♀

BIN. Binder Park Zoo; TOP. Topeka Zoo; ABQ. Albuquerque BioPark Zoo; BRK. Brookfield Zoo; OKC. Oklahoma City Zoo. * Excluded for behaviour analysis day 1.

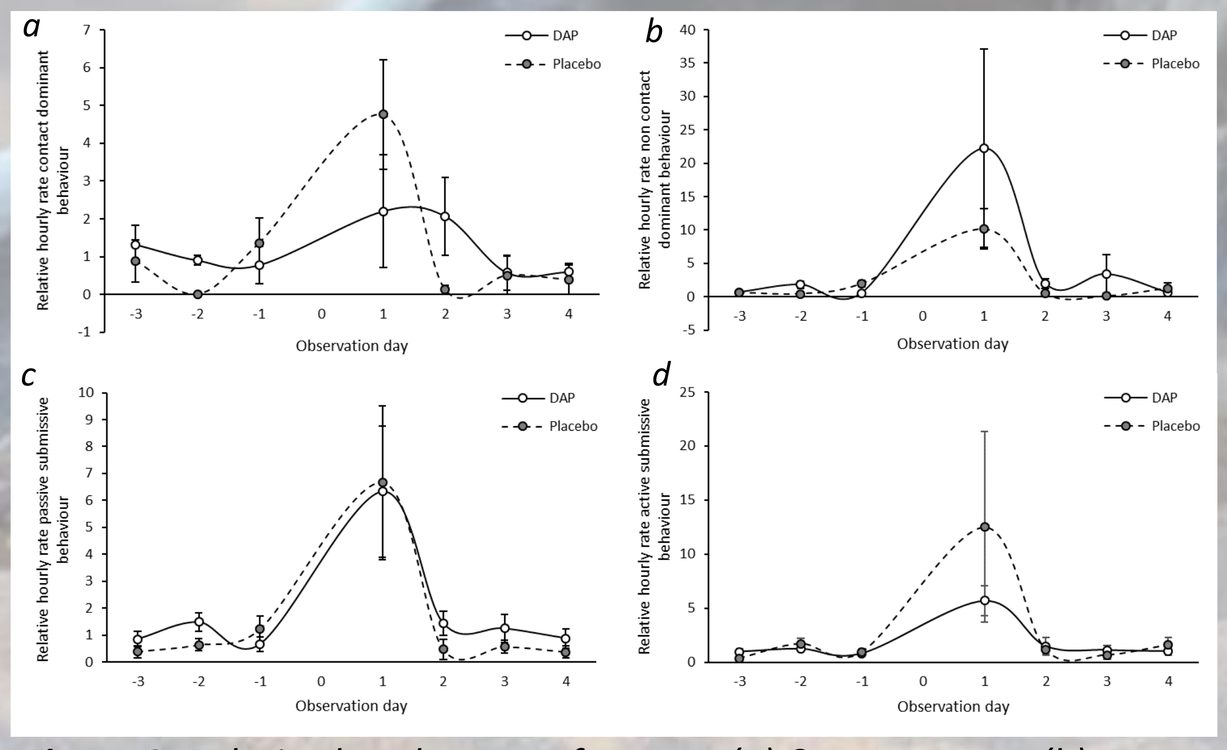


Figure 2. *Relative hourly rates of contact (a) & non-contact (b) dominance behaviour, & passive (c) & active (d) submission.*

Results

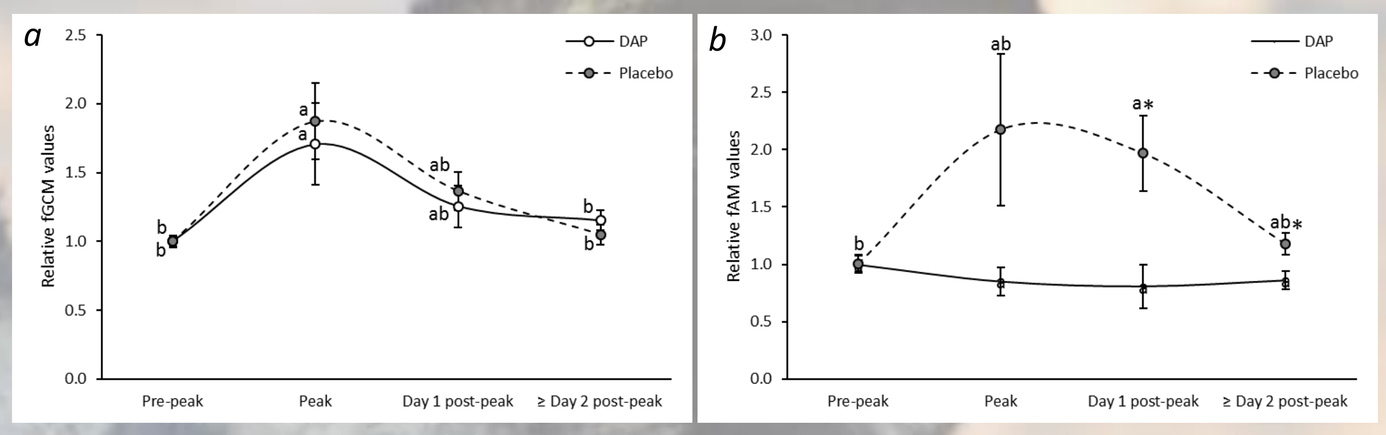


Figure 1. *Relative fGCM (a) & fAM (b) values for DAP & placebo treated animals in samples collected before (pre-peak), & after (peak, day 1 post-peak, ≥ day 2 post-peak) immobilisation & pack reintroduction. Different letters indicate differences between time points. * indicates differences between treatments.*

Faecal glucocorticoid metabolites

- Rise in placebo & DAP group (*Fig. 1a*).
- Ratio peak/pre-peak value > 1 in 63.6 % of DAP & 83.3 % of placebo treated animals (p=0.275). Ratio > 1.5 in 54.5 % of DAP and 75.0 % of placebo treated animals (p=0.278).

Faecal androgen metabolites

- Rise in placebo group, absent in DAP group (*Fig. 1b*).
- Ratio peak/pre-peak value > 1 in 27.3 % of DAP & 66.7 % of placebo treated animals (p=0.059). Ratio > 1.5 in 9.0 % of DAP & 50.0 % of placebo treated animals (p=0.045).

Behaviour

- During reintroduction, tendency towards higher rate of contact dominance behaviour in placebo treated packs (*Fig. 2a*) & higher rate of non-contact dominance behaviour in DAP treated packs (*Fig. 2b*).
- Tendency towards higher rate active submission in placebo treated packs (*Fig. 2d*).
- No differences in rates of affiliative or aggressive behaviour. Aggressive behaviour during reintroduction was absent in all packs.

Discussion-Conclusion

The absence of differences in fGCM in both treatment groups might be due to immobilisation-related stress. AWDs perceive DAP which is reflected in the absence of a testosterone increase after reintroduction. Together with a trend towards a lower rate of contact dominant behaviour, this could decrease the risk of aggression. However, to explore the behavioural differences further, more research is needed with (1) a higher number of packs; or (2) AWD specific appeasing pheromones.

Acknowledgements

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