

Effect of sensory enrichments on the behaviour of captive Northern lynx

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Introduction

Captive environments like zoo exhibits offer limited space which lack a lot of the environmental stimuli that can be found in the wild. This may reduce animal welfare and potentially lead to the development of stereotypic behaviour like pacing. Environmental enrichment is used to prevent and reduce stereotypic behaviour and enhance animal well-being.

Aim

Evaluate the responses to different sensory enrichments, and the effect of such enrichment on pacing in a group of Northern lynx (*Lynx lynx lynx*) by means of new, automated monitoring technologies in combination with traditional visual observations.

Materials and Methods

The visual observations were collected using one/zero and continuous sampling methodology.

The lynxes were exposed to **valerian**, **catnip** and **cinnamon** as olfactory enrichment. They were applied on a branch attached to a tree at a place called the scent station.

The acoustic enrichments were **mouse squeals**, **roe deer barking**, **lynx vocalizations** played through a speaker.



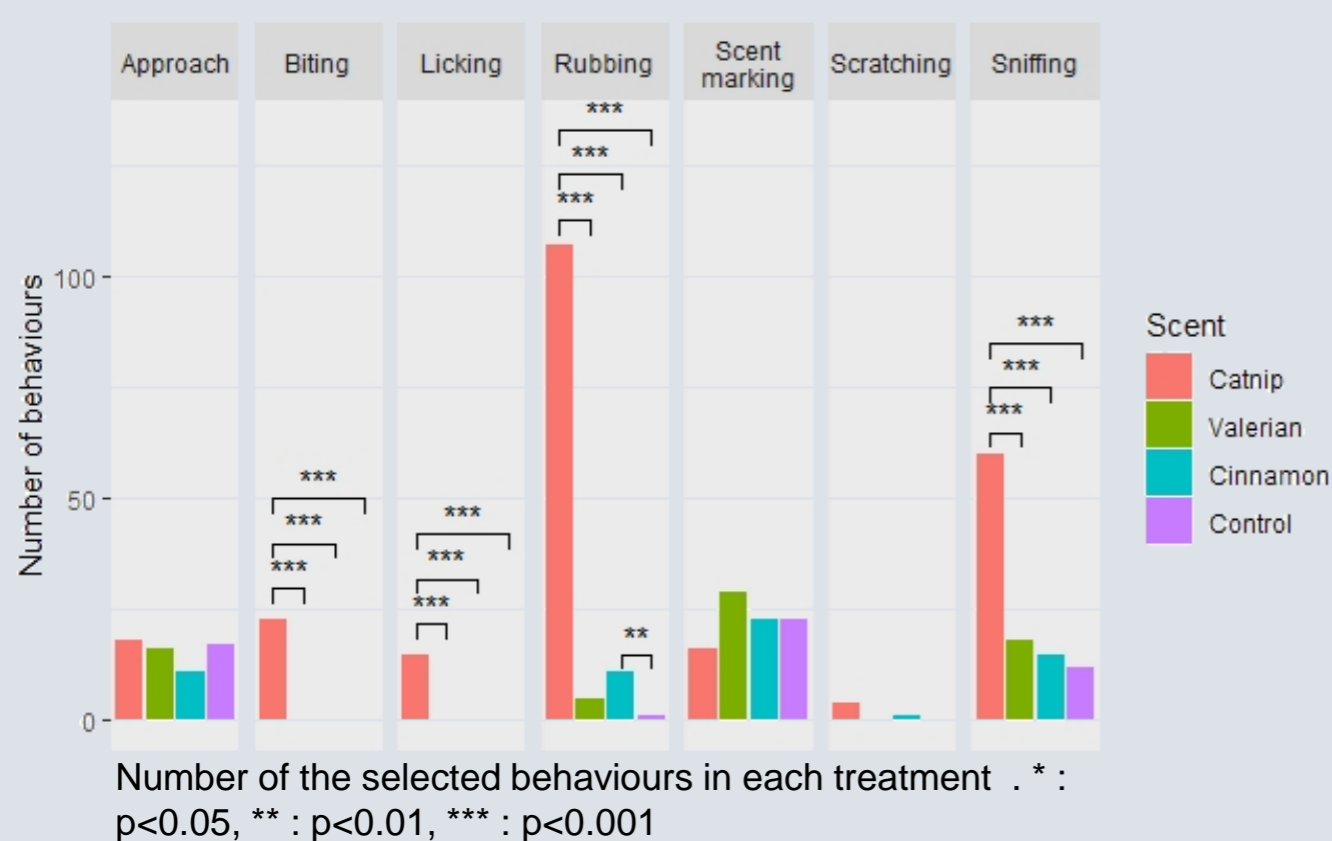
Automated monitoring. 1 : HDX PIT tag "pacing" antenna, 2 : Scent station with HDX PIT tag "scent" antenna and BLE tag, 3 : Reconyx Hyperfire wildlife camera.

Monitoring technology :

1. HDX pit tag antennas used to monitor lynxes visits to the scent station and pacing ; 2. Bluetooth Low Energy (BLE) transmitters attached to a collar; The transmitter signals were logged by smartphones placed in plastic boxes at the scent station and hence recorded the lynxes' visits to the scent station; 3. a wildlife camera for recording the behaviour of the lynxes visiting the scent station.

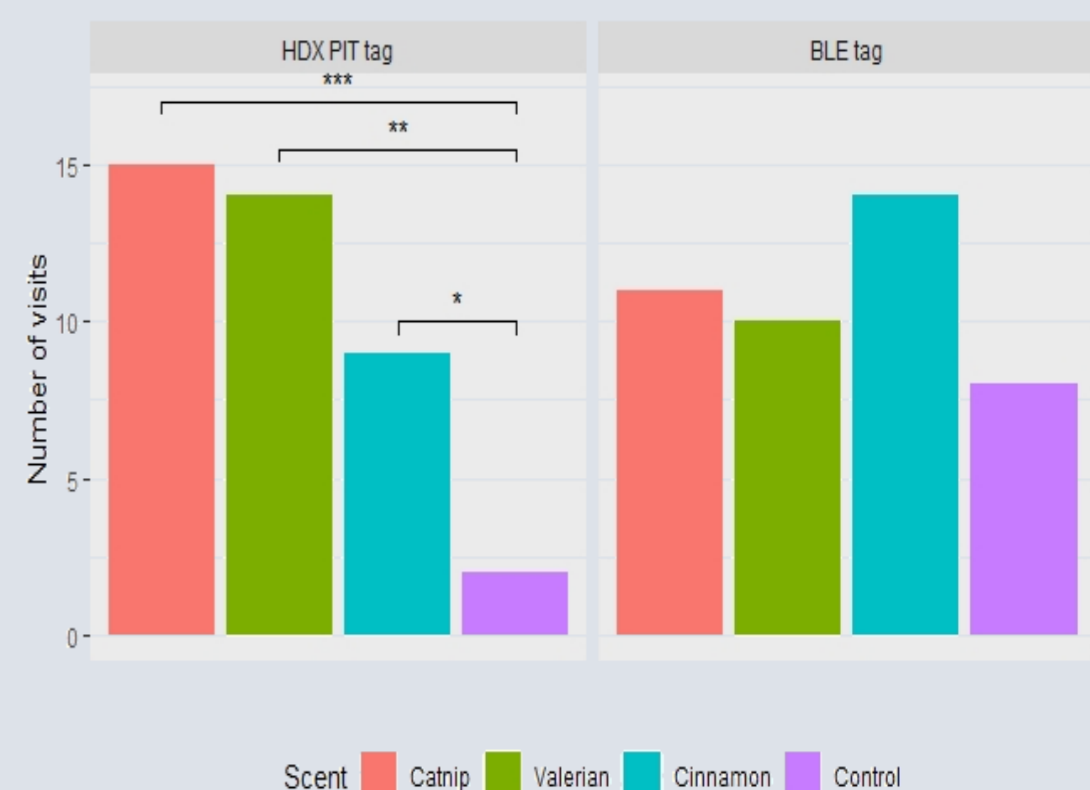
Results

Visual observations



Catnip elicited a clear "catnip response", i.e *biting, licking, rubbing, sniffing.*

Automatic logging



HDX PIT tag and BLE tag detections. Total number of visits at the scent station for each odour treatment * : p<0.05, ** : p<0.01, *** : p<0.001

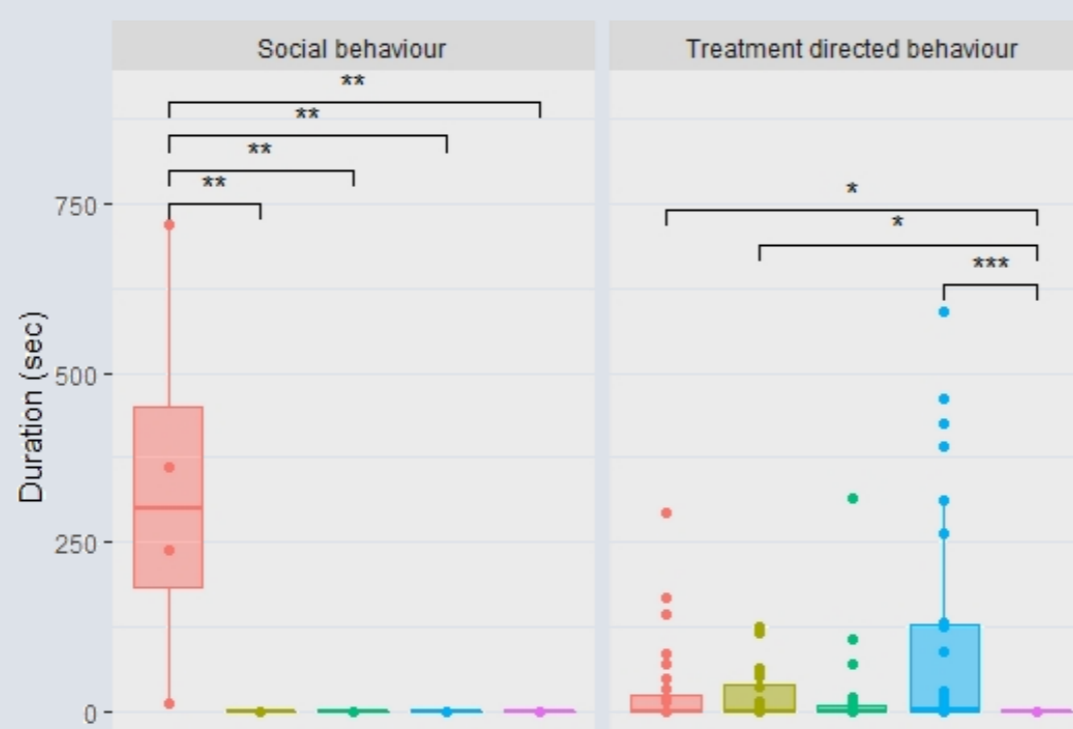
HDX PIT tag : more visits with the catnip, cinnamon and valerian treatments compared to the control.

BLE tag : equally frequent with each odour treatment .

Reconyx camera : no differences in the number of the selected behaviours between the odours



The lynx call provoked social behaviour. Conspecific and prey sounds were found to attract the lynxes by increasing their arousal.



Duration of social and treatment directed behaviours per sound treatments. * : p<0.05, ** : p<0.01, *** : p<0.001

Pacing

None of the sensory treatments were found to decrease pacing.

Conclusion

Catnip elicited highest frequency of *treatment-directed* behaviour in these lynxes. The combination of these automated technologies with visual observation was powerful to evaluate the effect of enrichment on captive lynxes and to monitor their activity patterns and pacing.

