

Olfactory enrichment in captive Asian elephants (*Elephas maximus*)



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1 Introduction

Elephants are long-living and large-brained mammals. Due to their highly-developed cognitive and sensory abilities, it is a challenge to provide captive elephants with adequate environmental enrichment in order to prevent poor welfare.

The present study therefore assessed the effect of different objects and odors as environmental enrichment for captive Asian elephants.

2 Material & Methods

Four Asian elephants participated in the study. They were maintained at Kolmården Wildlife Park in Sweden.

Odor stimuli

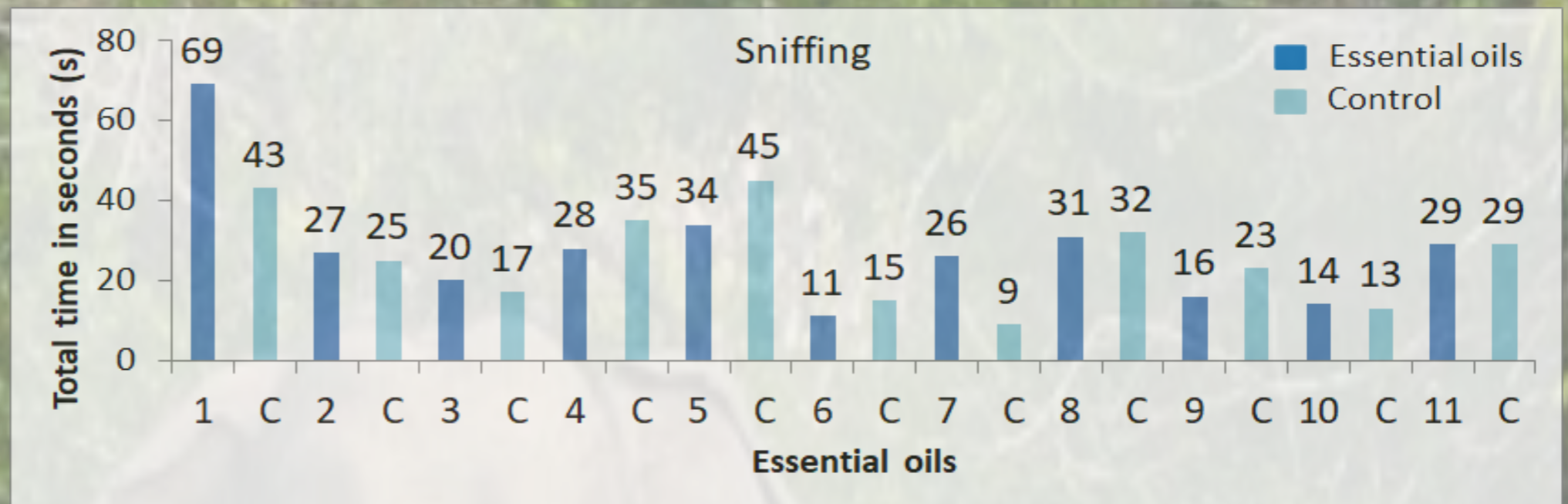
| Essential oils & Monomolecular odorants |
|---|
| 1. Cardamom |
| 2. Vanilla |
| 3. Lemon |
| 4. Orange |
| 5. Mint |
| 6. Cinnamon |
| 7. Lavender |
| 8. Elderflower |
| 9. Geosmin |
| 10. 1-octen-3-ol |
| 11. trans-4,5-epoxy-(E)-2-decenal |

| Spices |
|-------------------|
| 1. Lemongrass |
| 2. Curry |
| 3. Turmeric |
| 4. Ginger |
| 5. Cinnamon |
| 6. Clove |
| 7. Paprika |
| 8. Black Pepper |
| Control |
| Diethyl phthalate |

Mode of presentation

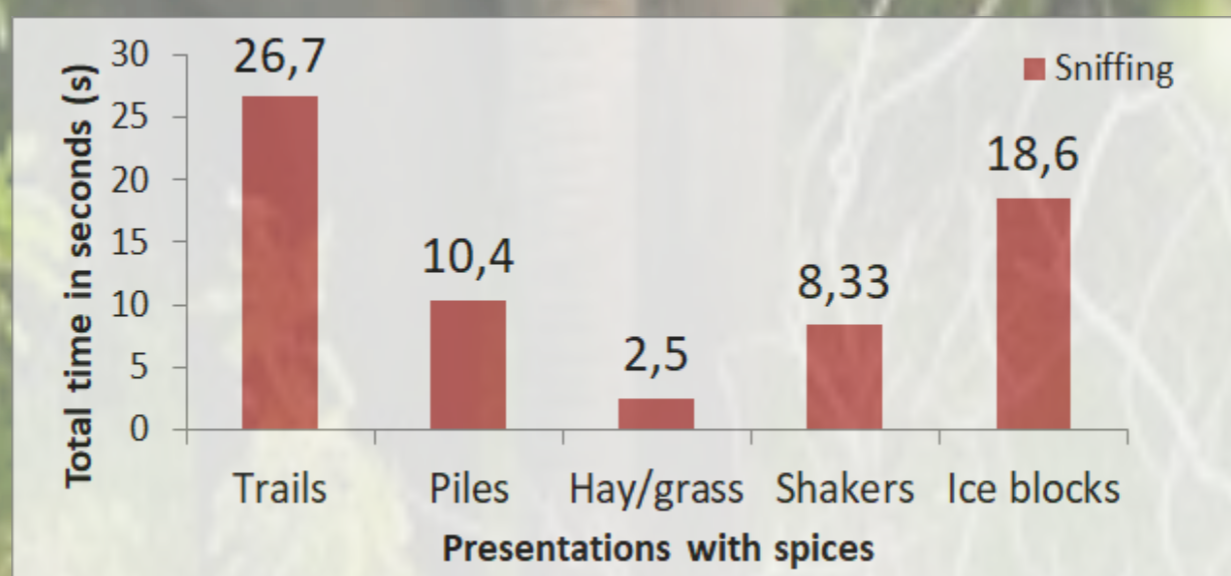
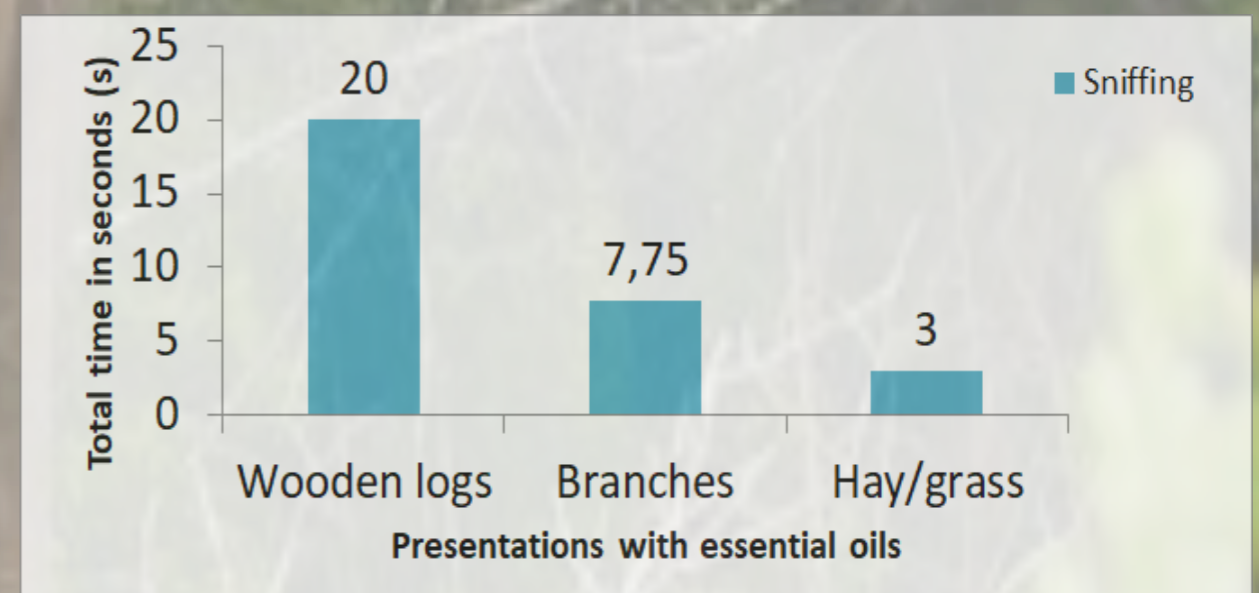
| Essential oils & Monomolecular odorants | Spices |
|---|-----------|
| Wooden logs | Trails |
| Branches | Piles |
| Hay/Grass | Hay/grass |
| | Shakers |
| | Ice cubes |

3 Results



The results showed that the elephants significantly differed in their interest towards the different odor stimuli. The essential oil of cardamom, for example, was significantly more attractive, in terms of time spent sniffing, compared to all other when presented on wooden logs.

The different modes of presenting odor stimuli affected how much interest the elephants displayed. The presentation on wooden logs was significantly more attractive compared to the other modes of presentations.



The presentation of spices as trails was more attractive compared to the presentation on hay/grass and shakers.

4 Conclusion

In conclusion, these findings suggest that odor stimuli seem to be an effective way to enrich the environment of Asian elephants, and to improve their welfare in a zoo setting.