

Background

The behavior of Asian elephants has been studied in some detail and suggests that chemical communication is an important part in their social interactions .

The elephant is one of the few mammal species so far for which a sex pheromone has been chemically identified and functionally verified.

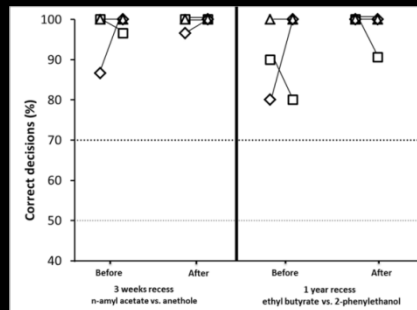
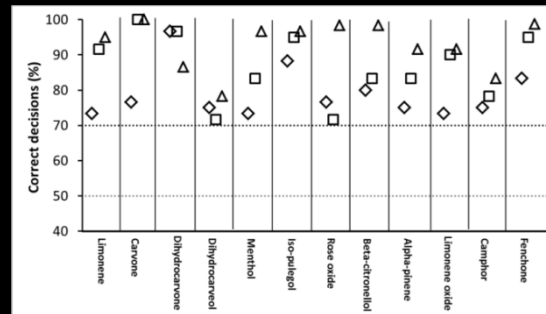


The aim of the study was to collect data on olfactory discrimination performance for structurally related odorants in three female Asian elephants, to collect data on olfactory long-term memory and to compare data to those of other species tested previously on the same sets of odorants.

Results

The results showed that all elephants were able to discriminate between all aliphatic odorants tested and all enantiomeric odor pairs. The discrimination performance of structurally related aliphatic odorants increased with decreasing structural similarity of the odorants. They also remembered the rewarded value of n-amyl acetate and ethyl butyrate after three weeks and one year of recess.

These are the results of Saba(diamond), Saonoi(square) and Bua(triangle) for the enantiomers and the memory test.



Material & Methods

By using an food-rewarded two-alternative operant conditioning the Asian elephants were food - rewarded with a carrot when they correctly identifying the rewarded odor.

The odorants used were four aliphatic ketones, alcohols, aldehydes and carboxylic acids, 12 enantiomeric odor pairs and n-amyl acetate vs. anethole for the three week memory test and ethyl butyrate vs. 2-phenylethanol for the one year memory test.



Conclusions

- ★ These three Asian elephants are able to discriminate between all structurally related aliphatic odorants and all enantiomeric odor pairs tested
- ★ The long-term odor memory was outstanding in these three Asian elephants since they remembered the rewarded value of the odor combination after one year of recess
- ★ These three Asian elephants are at least as good, or better at discriminating among aliphatic odorants and among enantiomeric odor pairs as other species (e.g., mice, humans, honeybees, South African fur seals)

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Olfactory discrimination performance and long-term odor memory in Asian elephants (*Elephas maximus*)



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