Olfactory sensitivity of spider monkeys for “green odors”

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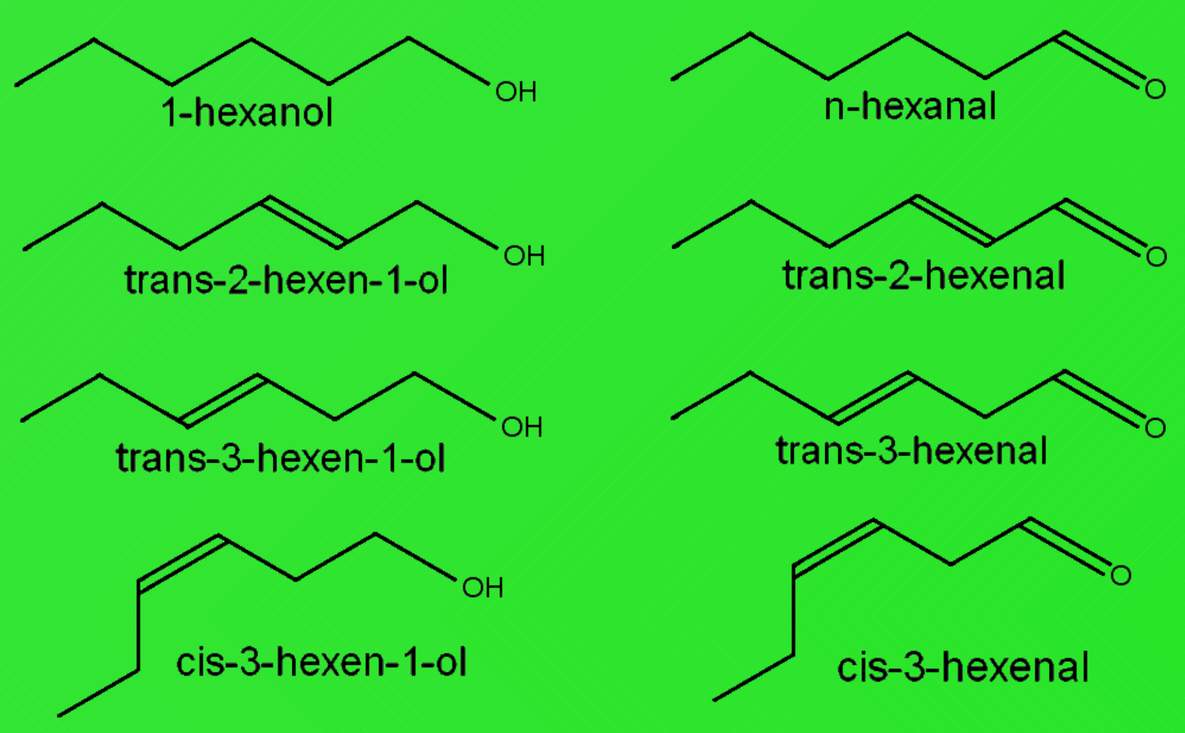
Background

Primates and olfaction

- Behavioural relevance may determine the olfactory sensitivity of a species to an odorant

“Green odors”

- Commonly found in plant material
- Structurally related with eachother
  - Differ in presence, position and orientation of a double bond



Aim

The aim was to determine olfactory detection thresholds in spider monkeys for "green odors", and to assess the impact of molecular structural features on olfactory detectability.

Methods

Two-choice instrumental conditioning paradigm

- Monkeys had to choose between a paper strip impregnated with the odorant and one with an odorless solution
- Correct choice was rewarded
- Odorant concentration was systematically decreased until the monkeys could not detect it, and a threshold value was determined

Results

- With all odorants, the animals detected concentrations below 1 parts per million, and single individuals performed even better
- The type of functional group affected olfactory detection thresholds, but presence, position and configuration of a double bond did not
- The thresholds for “green odors” are generally in the higher range of thresholds compared to previously tested classes of odorants
- Spider monkeys are generally not as sensitive to “green odors” as mice and humans

Conclusion

- **Spider monkeys have a well-developed ability to detect “green odors”**
- **They are not as sensitive to “green odors” as to previously tested odorant groups**
- **They are less sensitive to “green odors” than mice and humans**
- **Behavioral relevance may explain within- and between species differences in olfactory sensitivity**

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