

Gustatory response to ethanol in spider monkeys

Student: Daniel Dausch-Ibañez Supervisor: Matthias Laska

Introduction

Recent studies suggest that frugivorous primates might display a preference for the ethanol produced by microbes in overripe, fermenting fruit as an additional source of calories. The present study therefore assessed taste responsiveness of nine spider monkeys (*Ateles geoffroyi*) to dietary ethanol and determined taste preference thresholds for ethanol and sugarcane alcohol, as well as relative taste preferences for ethanol presented in sweet-tasting solutions and in fruit matrices, respectively.

Methods

A two-bottle preference test of short duration (1 min) was used, in which ethanol solutions between 0.05 % and 3 % were tested against either water, a sucrose solution, or pureed fruit.



Results

The determined taste preference thresholds for ethanol was at 0.5 % ethanol, and all tested concentrations above the threshold were significantly preferred over water

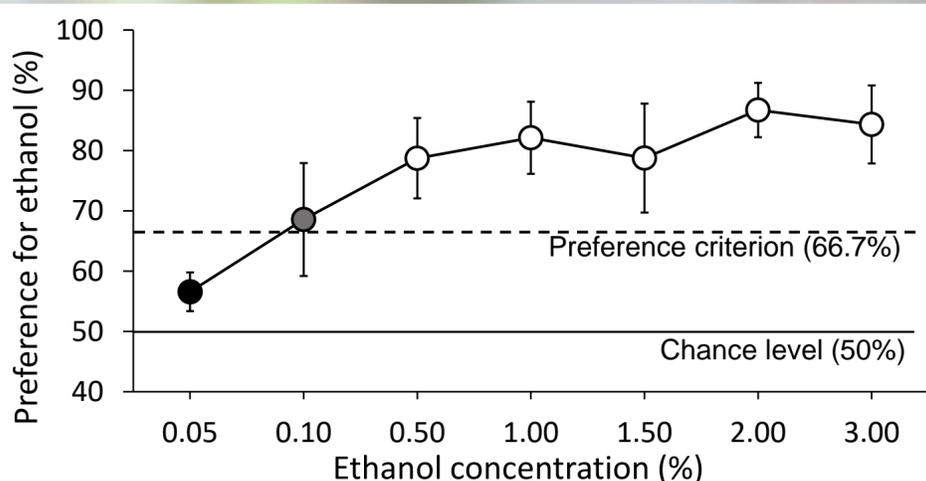


Fig. 1: Group-average preference for ethanol solutions of different concentrations, tested against water.

The spider monkeys significantly preferred sucrose solutions spiked with 0.1, 0.5 and 3 % ethanol over non-spiked solutions of the same sucrose concentration (30mM and 60mM), but significantly rejected the ethanol-spiked 30mM solution when tested against a sweeter (60mM) sucrose solution without ethanol.

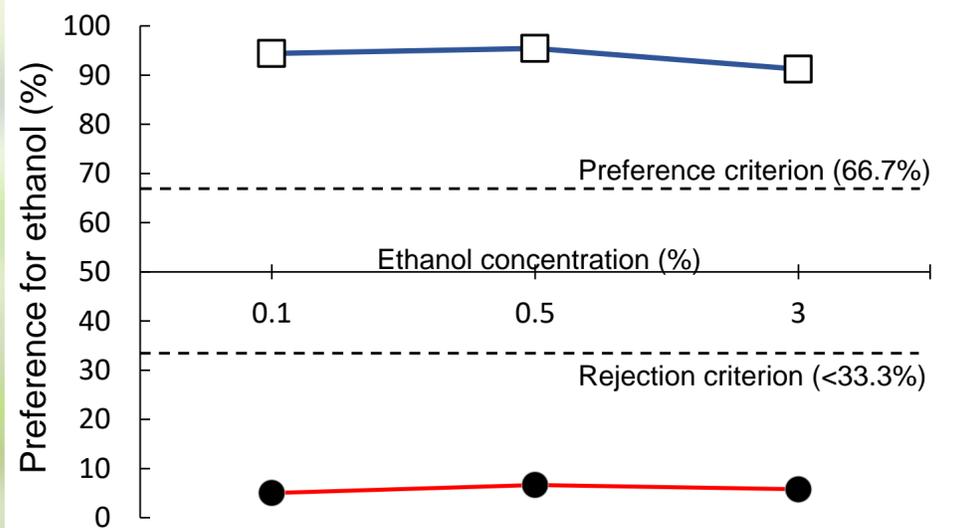


Fig. 2: Blue line: Group-average preference for ethanol-spiked 30mM sucrose solution tested against non-spiked 30mM sucrose solution. Red line: Group-average preference for ethanol-spiked 30mM sucrose solution tested against non-spiked 60mM sucrose solution.

The spider monkeys significantly preferred pureed fruits (mango, melon, and papaya) spiked with 3 % ethanol when tested against the same puree without ethanol, and the degree of preference for the ethanol-spiked puree increased with the sugar content of the fruit used.

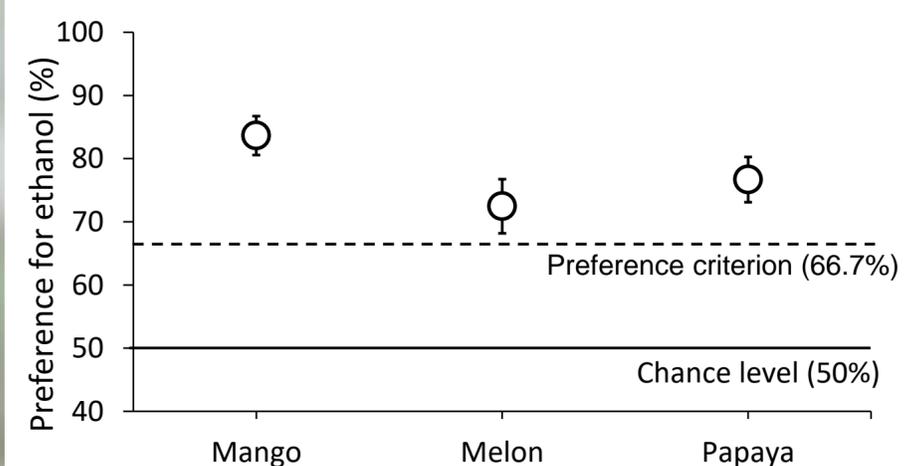


Fig. 3: Group-average preference for ethanol-spiked fruit purees tested against non-spiked fruit purees.

Conclusion

The spider monkeys tested showed a preference for ethanol concentrations between 0.1 % and 3 % diluted either in water, sucrose solutions, or pureed fruit, when tested against alcohol-free alternatives of the same diluent. The spider monkeys had a stronger preference for sucrose than for ethanol, regardless of the caloric content of the solution.