

To Flehman or not to Flehman?

Kristin Benefit

Globe University

To Flehmen Or Not To Flehmen?

A variety of animal species depend on their sense of scent for numerous survival methods. In two species, most predominantly being ungulates and felids, the olfactory senses have been proven to be a large part in the sociosexual interactions. Both these groups elicit what is known as the “Flehmen Response” which is characterized by “draws its lip back from its teeth into a grimace” (Metpet.com staff writer, n.d., para. 2). It is thought that this reaction pertains mainly in response to sociosexual behavior in that they do this to smell the urine of females. It has also been supported that more males elicit this behavior than females. My hypothesis attempts to focus on the feline species in particular and prove that the occurrence of the Flehmen Response is not relevant solely in the sexual behaviors but also to a wide array of strong smelling odors.

Ungulates and felids as well as some other mammals have a specialized organ called the Vomeronasal organ located on the soft palate of the mouth behind the front teeth. This organ facilitates animals in olfactory investigation. “A cat that is using this organ will open his mouth and make an odd face, as though he is sneering, grimacing, or frozen with his mouth slightly open, as he draws air into the organ to check it” (Copley, 2009, para. 1). During normal respiration “up to thirty percent of inhaled air is deviated to the olfactory mucus. In that way, animals perceive the odors when breathing. The Vomeronasal organ is not easily accessible during normal respiration. To be stimulated, it has to be opened and the pheromones can then go to the receptors on the membranes of the nervous cells of this organ” (Pageat & Gaultier, 2003, p. 188). It is for this particular reason feline’s part their mouths when displaying Flehmen.

Ungulates such as cattle, deer, goats and horses have all been studied in regards to the Flehmen response. One particular study was enacted by observing the behavior of 5 stallions and between 3 - 18 mares in a pasture at varying times throughout the day. The behaviors of the

stallions and mares were observed in their natural habitat or pasture several times throughout the day throughout an entire season. During the course of their study they also found that stallions could not differentiate a horse's sex based on feces but were able to differentiate on the basis of urine. Several findings of this study maintain the hypothesis attempting to be proven here as seen through their results. "The Flehmen response was most frequently followed by marking behaviors rather than courtship behaviors. The results suggest that the Flehmen response is not an immediate component of sexual behavior" (Stahlbaum & Houpt, 1989, p. 1207). During the course of their study they also found that stallions could not differentiate a horse's sex based on feces but were able to differentiate on the basis of urine.

Another study involving felines' Flehmen response, may also lend support to the hypothesis. This study observed 10 intact male cats and 11 female spayed cats. It was previously thought that Flehmen was primarily exhibited by male felines only in order to facilitate sexual activity. This study found that females also exhibit the Flehmen response and not only in response to male scents such as urine but also involved females investigating other female genitalia succeeding the Flehmen response. "It would appear as though Flehmen behavior is mediated by a somewhat different neuronal system than that which governs male sexual behavior" (Hart & Leedy, 1987, p. 52). "The odor of the pheromones can be a stimulus that induces the opening of the Vomeronasal organ" (Pageat & Gaultier, 2003, p. 188). This supports the hypothesis that sexual pheromones may not be the only odors initiating Flehmen. The hypothesis is further supported by studies that have proven the Flehmen response was not reduced in castrated animals.

To test the hypothesis, an experiment involving 40 felines will be conducted. They will be divided up into four groups: 10 sexually intact male cats, 10 sexually intact female cats, 10

neutered males and 10 spayed females. This diversity will allow for testing of various levels of hormones as possible causes and variables for change. Each animal will be tested in sterile, completely enclosed rooms individually. The rooms will be sanitized after each use to ensure that the smell of previous animal will not be a factor for interference with the experiment. Each of the testing rooms will have nothing in them but the intended subject for nasal/ odor inspection. There will be four items for each of the animals to inspect one at a time. Each animal will investigate one item per day for intervals of 10 minutes at a time. The four items that will be tested for Flehmen response will be diesel fuel, fresh ground strong coffee, Roquefort blue cheese and a pair of used sweaty sneakers from a person not having any contact with animals. Each of the cat's responses will be reported in detail upon observation.

References

Copley, J. (2009, May 2). *The Flehmen response in cats*. [Web log post]. Retrieved February 18, 2010

from http://www.suite101.com/blog/shaya_weaver/the_flehmen_response_in_cats

Hart, B. L. & Leedy, M. G. (1987). Stimulus and hormonal determinants of Flehmen behavior in cats.

Hormone and Behavior 21(1), 44-52. Retrieved from

http://www.elsevier.com/wps/find/journaldescription.cws_home/622842/description

Metpet.com Staff Writer. (n.d.). *Vomero-Nasal organ and the Flehmen response in cats*. Retrieved

February 20, 2010 from

http://www.metpet.com/Reference/Cats/Behavior/vmo_flehmen_cats.htm

Pageat, P. & Gaultier, E. (2003). Current research in canine and feline pheromones. *Veterinary Clinics of*

North America. Small Animal Practice 33(2), 187-211. Retrieved from

<http://www.vetsmall.theclinics.com/>

Stahlbaum, C. C. & Houpt, K. A. (1989). The role of the Flehmen response in the behavioral repertoire of

the stallion. *Physiology & Behavior* 45(6), 1207-1214. Retrieved from

<http://www.elsevier.com/locate/physbeh>