

Success of the Smelliest podcast. Dr Tristram Wyatt. Oxford Abridged Short Talk.

Notes

11 September 2010

YouTube: http://www.youtube.com/watch?v=I1JO4jBY_2w




The talk was part of '*Inspired by Evolution*', a series of lively 10 minute talks by prominent Oxford academics in the Museum Lecture Theatre, aimed at a general audience.









These followed the launch of Oxford Open Doors and the unveiling, by Professor Andrew Hamilton, Vice-Chancellor of the University of Oxford, of the Darwin Plinth to commemorate the 150th anniversary of the Great Oxford Evolution Debate.

<http://www.oxfordopendoors.org.uk/eventDetail.php?id=1192&code=ButtonSat>

Picture credits and further reading

For a general introduction to pheromones see Wyatt (2009) Fifty years of pheromones. *Nature* 457: 262-263 <http://tinyurl.com/323ta74> and see <http://tinyurl.com/2u2mmt6> and <http://users.ox.ac.uk/~abrg/pheromones/>

<p>Natural selection <small>Charles Darwin (1859) Origin p127</small></p> <ul style="list-style-type: none"> • some individuals have useful variations • these individuals survive struggle for life • offspring inherit these variations <p>"... sexual selection aids ordinary (natural) selection, by assuring to the most vigorous and best adapted males the greatest number of offspring. Sexual selection will also give characters useful to the males alone, in their struggles with other males."</p>	<p>Darwin statue in University Museum, photo by Lawrence OP</p> <p>http://tinyurl.com/328rl3h</p>
 <p>Charles Darwin (1871) <i>The descent of man and selection in relation to sex</i></p>	<p>peacock photo by Ethan Hein http://www.flickr.com/photos/ethanhein/3196915619/sizes/z/in/photostream/ deer stags photo by Sam Dredge http://www.flickr.com/photos/samdredge/196191587/sizes/m/in/photostream/</p>
<p>Darwin (1871) <i>The descent of man and selection in relation to sex</i></p> <p>Includes smells in sexual selection, along with the peacock's tail</p>  <p>"During the season of love, a musky odour is emitted by the ... glands of the crocodile, and pervades their haunts"</p> <p>Also: smelly male elephants, pythons, moths, birds ...</p>	<p>crocodile photo by peter nijenhuis http://www.flickr.com/photos/peternijenhuis/199729203/sizes/m/in/photostream</p>
 <p><i>Capra aegagrus hircus</i></p> <p>"The rank effluvia of the male goat is well known"</p> <p>Darwin (1871) p279</p>	<p>goat from Harter, J (1979). <i>Animals. 1419 Copyright-free illustrations of mammals etc.</i> New York, Dover.</p>

<p>The challenge of invisible odour signals</p>  <p>grayling butterfly courtship (1942)</p>  <p>Niko Tinbergen Professor of Zoology University of Oxford 1968 – 1976 Nobel Prize 1973</p> <p>But what were the signals? Surely chemicals, but no proof</p>	<p>butterflies Tinbergen et al (1942) <i>Z.f. Tierpsychol</i> 5:182-226. photo of Niko Tinbergen by L Shaffer http://users.ox.ac.uk/~abrg/history.html</p>
<p>The first pheromone identification: 1959 female sex pheromone of silk moth <i>Bombyx mori</i> by Adolf Butenandt & team</p> <p>He established the gold standard to find pheromones:</p> <ol style="list-style-type: none"> 1. Biossaying (wing flutter) 	<p>photo of silk moth males by kind permission of Professor Moto. Moto et al (2003). Pheromone gland-specific fatty-acyl reductase of the silkworm, <i>Bombyx mori</i>. <i>PNAS</i>, 100, 9156-9161. http://www.pnas.org/content/100/16.toc</p>
<p>Lobsters & crayfish</p> <ul style="list-style-type: none"> • Males fight: boxing & chemical signals in urine • Females choose winners  <p>Breithaupt & Eger (2002) <i>J. Exp. Biol.</i></p>	<p>Breithaupt, T. and Eger, P. (2002) <i>Astacus leptodactylus</i> releasing a plume of urine made visible by intra-vascular injection of Fluorescein. From http://jeb.biologists.org/cgi/content/full/205/9/1221 http://www2.hull.ac.uk/science/biological_sciences/people/academic_staff/thomas_breithaupt.aspx</p>
<p>Moth males - be the first</p> <ul style="list-style-type: none"> • female sex pheromone = faint signal (pg hr⁻¹) • males compete to find her • selection on males for high sensitivity, fast flight 	<p>moth male photo by Bob Harrison http://www.treknature.com/gallery/photo203452.htm spp unknown.</p>
 <p>Male coremata in moths – elaborate structures to release male pheromone</p> <p>Lekking arctid moth <i>Creatonotus gangis</i></p>  <p>P-cyrene</p>	<p>photo Professor Michael Boppré http://www.fzi.uni-freiburg.de/en/111.php and interview http://tinyurl.com/3xfr2v3</p>
	<p>photo by David Shankbone http://blog.shankbone.org/about/ http://en.wikipedia.org/wiki/File:Forever_Tel_Aviv_at_TLV_nightclub_in_Israel_2.jpg</p>

Which areas are possible smell sources?

Reykjavik Swimming Pools:
The Naked Truth

Observe!

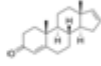
Every guest is required to wash thoroughly without a swimsuit before entering the pools. Thank you.



<http://blog.icelandexpress.com/iceland/2006/11/24/reykjavik-swimming-pools-the-naked-truth/>

Problem – none identified yet

- Commercial 'human pheromones' and some scientific studies use 'putative pheromone' androst-4,16-dien-3-one



- It is found in human emplit secretions
- But no more in M than F (Caine et al 1991; Zwerdloren 1994)
- No scientific bioassay-guided evidence that it's a pheromone or active at natural concentrations

(Wysocki & Preti 2009)

Wysocki C & Preti G (2009) Human pheromones: what's purported, what's supported. *A Sense of Smell Institute White Paper*

http://senseofsmell.org/papers/Human_Pheromones_Final%207-15-09.pdf