

Pheromones: evolutionary contexts, contrasts and convergence.

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The organisation of the olfactory system and brain makes it almost inevitable that chemical communication will evolve as animals are selected to respond to their chemical environment. It is thus no surprise that pheromones play key roles in the lives of organisms throughout the animal kingdom.

Signals are derived from movements, body parts or molecules already in use and are subsequently changed in the course of evolution to enhance their signal function. Thus pheromones evolve from compounds originally having other uses or significance, for example from hormones, host plant odours, chemicals released on injury, or waste products. There is selection for functional signal features such as longevity and specificity. There is also evolution in the sensory systems and response of the receiver. The original functions of the chemicals may or may not be eventually lost.

Like insects, mammals and other vertebrates can use small molecules, singly or in simple mixtures, as pheromones for sexual signalling. It is harder to identify mammalian pheromones than those of insects but this does not necessarily mean that their pheromones are more complicated.

One of the most important uses of odour signals in both mammals and social insects is as signature odours, chemical cues used for social recognition. Signature odours do not fit the Karlson and Lüscher's 1959 pheromone criterion of a defined chemical mixture eliciting particular behaviour or other response. The cues used for social recognition of kin, clans, colony members and the like are complex, greatly varied mixtures of many compounds. The differences between the odour mixtures are the message.

About Speaker: Tristram Wyatt is an Oxford zoologist fascinated by the ways animals (and humans) communicate with smell. This is the focus of his text book Pheromones and Animal Behaviour, published by Cambridge University Press in 2003, to excellent reviews (see <http://www.online.ox.ac.uk/pheromones/>). He has featured in many TV and radio programmes about animal behaviour. His work has appeared in Natural History and New Scientist magazines as well as the scientific literature. He works in the Zoology Department at the University of Oxford. He is also the University's Director of Distance and Online Learning, based in the Department for Continuing Education, and Oxford's liaison with AllLearn <http://www.alllearn.org/> (Stanford, Yale and Oxford's not-for-profit online learning project for the general public). Dr. Tristram Wyatt studied zoology as an undergraduate at Cambridge University and stayed on to do a PhD on the ecology of parental care in a staphylinid beetle, Bledius. During his career since then he has lectured/researched at the universities of Leeds, Cardiff, and University of California, Berkeley. Tristram Wyatt is a fellow of Kellogg College, Oxford.

**Author of Pheromones and animal behaviour:
communication by smell and taste. CUP (2003)**

Date: 8 Sept, Wed
Time: 4 - 5 pm
Venue: DBS Conference Room
Host: Dr Li Daigin

All are welcome