



Seewiesen Colloquia

Thursday, 12 November 2015, 13:00 h, in House 4, Lecture Room

The evolution of sweet taste perception in birds

Maude Baldwin

MPI for Ornithology, Research Group Evolution of the sense of taste in birds

Taste is a crucial sense: it allows animals to select food that is nutritious, and to avoid potential toxins. Most mammals perceive and are attracted to (if not hooked on) sugars, yet the evolutionary history of sweet perception in vertebrates is not straightforward. Studying the sense of taste in a comparative framework can provide insight into questions about the evolution and function of sensory systems and shed light on basic mechanisms of the evolutionary process. Birds appear to taste sweet in a different way than mammals do. Following an early loss of the vertebrate sweet receptor, hummingbirds re-evolved a new carbohydrate sensor, using the savory, or umami receptor, instead. Multiple other radiations of birds are fruit- or nectar-feeding and are likely sensitive to sugar, yet how they detect carbohydrates is unknown. In our group we will examine the mechanisms by which birds perceive sweet and will investigate the extent of convergent evolution; in addition, we are looking at the origin of sweet taste in vertebrates in a broader phylogenetic context. We use an integrative approach, combining molecular and cell-culture techniques with behavioral studies. In addition, we will develop new tools to probe the function and evolution of the taste system in birds and to examine the effects of diet shifts on organismal ecology and physiology.

Who is Maude Baldwin?

2015	Max Planck Research Group Leader, Seewiesen
2007- 2014	PhD Harvard University
2005	BA New York University, Gallatin School

Selected publications:

- Baldwin*, M. W., Toda*, Y., Nakagita, T., O'Connell, M. J., Klasing, K. C., Misaka, T., Edwards, S. V., Liberles, S. D. 2014. Evolution of sweet taste perception in hummingbirds by transformation of the ancestral umami receptor. **Science**, 345: 929-933.
- Roura, E., Baldwin, M. W., Klasing, K. C. 2013. The avian taste system: potential implications in poultry nutrition. **Animal Feed Science and Technology**, 180: 1-9.
- Kim, W., Peaudecerf, F., Baldwin, M. W., Bush, J. W. 2012. The hummingbird's tongue: a self-assembling capillary syphon. **Proceedings of the Royal Society B: Biological Sciences**, 279 (1749): 4490-4496.
- Organ, C. L., Rasmussen, M. D., Baldwin, M. W., Kellis, M., Edwards, S. V. 2010. Phylogenomic approach to the evolutionary dynamics of gene duplication in birds. In: **Evolution after gene duplication** (K. Dittmar & D. Liberles eds), pp. 253-268. Wiley-Blackwell, Hoboken, NJ.