

SEEWIESEN

LECTURE SERIES

FALL/WINTER 2018/19

Max Planck Institute
for Ornithology



MAX-PLANCK-GESELLSCHAFT

THURSDAY | December 13th, 2018 | 13 P.M. | HOUSE 4 LECTURE ROOM

IAN BALDWIN

Max Planck Institute for Chemical Ecology, Jena | Host: Department Gahr

Plant Behavior: examples from *Nicotiana attenuata*

Behavior, like beauty, is in the eyes of the beholder, and to understand how plants behave, one needs to appreciate their chemical prowess, as their behaviors are frequently played out on a chemical stage. Thanks to the long-term patient funding of the Max Planck Society, we have developed a fire-chasing native tobacco plant, *Nicotiana attenuata*, which grows in the Great Basin Desert, into an ecological model for the study of plant-ecological interactions in general and more specifically for the chemical behaviors that mediate this plant's responses to biotic interactions that dominate the primordial agricultural niche. By training students in the lost art of natural history discovery, we have used the plant's natural history interactions to phenotype transformed and recombinant inbred lines (RILs) of this plant, in a nature preserve in the plant's native habitat, to understand the function of genes that mediate these chemical behaviors. This talk will describe what 5 native insect herbivores have taught us about behaviors that are essential for that plant function. The 5 insects come from different feeding guilds, attack different tissues at different developmental stages and have revealed different chemically-mediated behaviors that are essential for the plant's survival. The over-arching take-home message of this talk is lifted from the playbook of the two founders of the discipline of Chemical Ecology (Thomas Eisner and Jerrold Meinwald), namely: the irreplaceable value of nature preserves as laboratories for the study of gene function.

WHO IS IAN BALDWIN?

1981	A. B. Biology/Chemistry Dartmouth College, Hanover, New Hampshire,
1989	Ph.D. Chemical Ecology, Cornell University, Section of Neurobiology and Behavior
1989-1996	Assistant, Associate, Full Professor, Department of Biology, SUNY Buffalo
1996-	Founding Director, Max Planck Institute for Chemical Ecology, Jena Germany

SELECTED PUBLICATIONS

We have published about 500 papers on the *N. attenuata* system, the majority of which illustrate some aspect of the "chemical behavior" of this remarkable plant. The following iBiology videos provide an easily accessible digest of some of the major discoveries of this work:

Baldwin, I.T. (2016). <https://www.ibiology.org/plant-biology/studying-plants-ecological-interactions-genomics-era-story-nicotiana-attenuata/>: The Story of *Nicotiana attenuata*. Video Talk on iBiology.

Part 1: <https://www.ibiology.org/plant-biology/studying-plants-ecological-interactions-genomics-era-story-nicotiana-attenuata/#part-1>

Part 2: <https://www.ibiology.org/plant-biology/studying-plants-ecological-interactions-genomics-era-story-nicotiana-attenuata/#part-2>

Part 3: <https://www.ibiology.org/plant-biology/studying-plants-ecological-interactions-genomics-era-story-nicotiana-attenuata/#part-3>

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