

**Behavioral assessment of olfactory and trigeminal responsiveness of starlings *Sturnus vulgaris* to nine anthranilates**

J. Russell Mason and Larry Clark<sup>1</sup>

USDA/APHIS/ADC, Denver Wildlife Research Center and Biology Department, University of Pennsylvania, c/o Monell Chemical Senses Center and <sup>1</sup>Monell Chemical Senses Center, 3500 Market Street, Philadelphia, PA 19104, USA

Irritating substances and the systems mediating irritation may differ fundamentally between birds and mammals. For example, dimethyl anthranilate, a flavoring preferred by at least some mammals, is aversive and apparently irritating to birds. We have begun investigations designed to elucidate relationships between the structure of anthranilate molecules and repellency. Also, we are conducting experiments to identify sensory systems mediating anthranilate detection. Here, we report a series of behavioral experiments that explored the responsiveness of starlings to dimethyl anthranilate and eight derivatives (ethyl; isobutyl; isobutyl N,N dimethyl; isobutyl methyl; linalyl; methyl; phenyl ethyl; propionyl methyl). Repellency was correlated with volatility only. Tests with intact birds and birds given bilateral olfactory or naso-trigeminal nerve cuts demonstrated that both olfaction and naso-trigeminal chemoreception were important for detection. Because combined olfactory and naso-trigeminal nerve cuts did not completely eliminate responding, we infer that gustation and/or oral trigeminal chemoreception may be important. Because behavioral experiments on taste, *per se*, are difficult to perform, we have begun a series of electrophysiological investigations of that sensory system to assess relative responding to the anthranilate series. Partial correlation analyses will be used to compare olfactory, trigeminal and gustatory electrophysiological responses to the mean repellency of the anthranilates.