compounds were behaviorally significant, and whether the level of response depended on relative abundances, we conducted a series of chemical playback experiments in standardized conditions. We presented selected compounds, alone or combined in different proportions, to recently captured adult males in 15 min behavioral assays and recorded chemosensory responses. Lizards produced the highest rates of chemosensory behavior toward secretions from other males (positive control), and significantly lower to fatty acids and an aromatic dipeptide. Interestingly, an aromatic pyrazine elicited nearly as much chemosensory behavior as the positive control. However, the level of response changed with abundance and not in the expected direction. The two aromatic compounds elicited an intermediate response when combined, even when the ratio (pyrazine:dipeptide) was doubled. We discuss our results within the context of animal communication.

Effects of kin on developmental plasticity in mangrove rivulus fish (Kryptolebias marmoratus): anchoring life history traits to behavioral traits and adult brain protein expression profiles
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Personality traits such as boldness and aggressiveness are known to strongly influence fitness. The mechanisms that underlie how these traits might respond to the environment during development remain largely unknown. The mangrove rivulus fish is the only self-fertilizing hermaphroditic vertebrate, produces isogenic lineages, and is an excellent model in which to investigate these mechanisms. This fish shows incredible variation in personality traits despite very low levels of genetic diversity. Rivulus larvae were exposed from 0 to 60 days post hatching (dph) to relatives (kin) of the same age. Isolated individuals were used as the control group. Fish boldness and aggressiveness were measured on adults (150 dph) using shelter and model tests. The cellular phenotype was then assessed at the protein expression level using a label-free quantitative proteomic workflow on fish brains. Our results demonstrate that kin exposure had a positive effect on fish growth and a negative effect on fecundity compared to control group. Kin did not impact adult behavioral traits but revealed 41 differentially expressed proteins in the brain compared to control. Regarding its capacity to self, rivulus is an excellent model in which to study the non-genetic determinism of personality traits and to identify environmental influences on plasticity.

Ecology and evolution of plumage patterns in Melanerpes woodpeckers
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Patterned plumage across Aves can serve a variety of ecological functions, from camouflage and signaling to thermoregulation and pest deterrence. However, our ability to study the ecology and evolution of plumage patterns has been stymied by the difficult task of objectively quantifying pattern in the context of relevant visual receivers. Using calibrated digital images of woodpecker specimens of the genus Melanerpes, we will quantify plumage patterns in both predator and conspecific pattern-color space using 2-dimensional Fast Fourier Transformation. The Melanerpes woodpeckers exhibit a range of complex plumage patterns, including horizontal barring, spotting, and mottling. To investigate how patterns evolved across the Melanerpes clade, we will use ancestral state reconstruction and will estimate the likelihood of transitions between pattern states. This will allow us to describe how patterns changed in different Melanerpes lineages and to determine the extent to which plumage pattern is phylogenetically constrained. To investigate the function of patterns, we will test a range of hypotheses by correlating pattern traits with ecological variables such as habitat and foraging behavior. Overall, this method of pattern quantification can be used to test hypotheses about pattern evolution and function in other animal species.
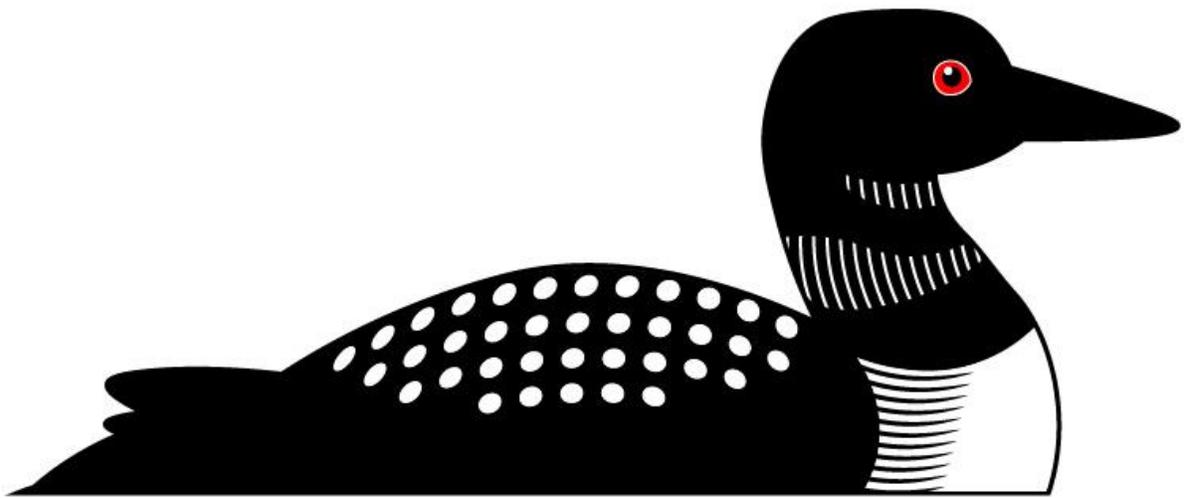
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