

ANIM3365 BEHAVIOURAL ECOLOGY

Week One: Intro & Animal Personalities

Week Two: Genetic basis of behaviour: Mendel to polygenic inheritance & Phenotypic Plasticity

Week Three: The importance of behavioural ecology for effective conservation management & Theory of Sexual Selection

Week Four: Pre-copulatory sexual selection & Post-copulatory sexual selection

Week Five: Total Sexual Selection & Alternative Mating Strategies

Week Six: Sensory Mechanisms & Sampling Visual Space

Week Seven: Controlling Gaze, Orientation and Navigation & Visual Illusions

Week Eight: Communication and Vocal Learning & Cooperation and Kin Selection

Week Nine: Social Insects & Kinship, Conflict and Cooperation in Social Insects

Week Ten: Cooperative Breeding & Parental Care

Week Eleven: Animal Cognition & Introduction to Predator-Prey Interactions

Week Twelve: Avoiding Attack & Grouping

Week One: Intro & Animal Personalities

Concept of Personalities

- = Individual consistency in behavioural tendencies across time and contexts
- Common personality traits: aggression, boldness/shyness, activity levels
- Individuals usually vary in a single behaviour, but in the simplest scenario this is consistent variation across time/context
 - Differences are maintained over environmental gradients
- Often common to have individual differences in behaviour plasticity
 - = Differences are not necessarily maintained over environmental gradients (some individuals exhibit greater plasticity (variation) than others)
 - E.g. commonly crabs retreat more quickly when temperature increases, but some crabs are different (can be a variation in response)
- Individuals may also differ consistently in more than one behaviour: can show individual covariation in functionally distinct behaviours
 - E.g. as aggressiveness increases, so could level of exploration

Behavioural Syndromes

- = Consistent differences in a suite of correlated behaviours that are carried across contexts
- Personality types are often associated with risk-taking behaviours: correlation between aggressiveness towards conspecifics during breeding season and boldness towards predators outside the breeding season
 - = Behavioural correlations are stable over time and context
- Behavioural syndromes can differ predictably among populations: correlation between aggressiveness, activity and exploratory behaviour
 - High predation = strong correlation
 - Low predation = weak/absent correlation
 - Conclusion: selection may favour correlations between traits

Correlated behaviours in great tits

- Exhibit consistent individual differences in: exploratory behaviour, aggression, neophobia (fear of new experiences)
- Fast explorers tend to be more aggressive and less neophobic (bolder): 'aggressive-boldness' syndrome

Limits to adaptive plasticity

- Activity correlations in prey salamanders
 - Optimal prey behaviour: increase activity at night (predators not active) and reduce activity during the day (predators active)

- Actual prey behaviour: positive activity correlations between presence and absence of predator and between day and night
- Aggressiveness of funnel web spiders
 - More aggressive females tend to: attack prey more quickly, attack conspecific territorial intruders, engage in higher, sometimes maladaptive sexual cannibalism (eat males before they have a chance to mate)

Evolutionary and Ecological Implications

1. Life Histories
 - Personality traits (boldness, activity, aggressiveness) often positively associated with food intake rates/productivity
2. Dispersal, colonisation and invasion
 - Personality-dependent dispersal seen in many organisms: less social animals often disperse further
3. Disease transfer
 - Individual activity levels and exploration behaviour positively correlated in larval amphibians, both predict parasite load
4. Information transfer
 - Boldness predicts social network structure in three-spine stickleback: bolder individuals = less interactions, more cliquish, higher activity levels
5. Speed of evolution & genetic constraints
 - Standing genetic variation may facilitate rapid adaptation to novel environments
 - But behavioural syndromes may also impose genetic constraints
6. Speciation
 - Behavioural syndromes can increase the chance of successful settlement into new habitats
 - Predicted that speciation rates might depend on behavioural syndromes