Introduction

Documenting in situ-specific variation in food acquisition behavior and investigating the consequences of that variation among individuals should strengthen macro-evolutionary comparisons among species.

It is expected that such comprehensive comparisons will deepen our understanding of the primary features of adaptedness that exemplify each species and each genus.

Lizards that live in open, desert scrub habitats are excellent model systems for studying the evolutionary ecology of food acquisition:

Lizards in northern deserts have few predators of which to be wary.

Prey of lizards can be counted.

Lizards can be observed closely outside of the reproductive season.

Lizards can be studied when thermal constraints are minimal.

Thus, focal observations can be performed when food acquisition is assumed to be the primary activity of these lizards.

Animals have four basic tasks:

- Acquire and utilize food
- Acquire mates and reproduce
- Evade, avoid, and defend against predators
- Cope with abiotic stresses & avoid abiotic extremes

How does each basic task relate to, or cause the behavioral, physiological and morphological features of the animal?

What is the intensity of challenges imposed by each task and how do these tasks compare in how they affect the animal’s features?

Food Acquisition Mode (FAM):

A coordinated set of physiological, behavioral, and morphological characteristics that are integrally involved in the search, detection, capture, and eating of food.

It is likely that many of the aforementioned characteristics are those that essentially characterize the principal features of adaptedness in a species.

Primary behavioral features of FAM:

1. The movement patterns while searching for food
2. The methods and modalities used for food acquisition
3. The means of capturing prey

Variation in food acquisition behavior of an ambush predator: patterns and correlates

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Standardized plot searches 200m x 200m plot, with flags at each 10m.

Periodic searches through day. 6-12 searches / period.

Sighting details recorded for each lizard.

Unpainted lizards caught, measured and painted.

Colors of painted lizards noted.

All resident lizards censused (G. wislizenii & its prey, A. tigris).

Behavioral variables that can be used to characterize food acquisition mode:

Number of movement bouts per minute (to find patch or prey) v.

Number of sedentary bouts per minute

Time spent per movement bout (consider velocity & distance) v.

Time spent per sedentary bout

Proportion of time spent moving v.

Proportion of time spent being sedentary

Proportion of prey detected & pursued during movement v.

Proportion of prey detected & pursued from sedentary position

Study Animal and Study Site

The subject species:

- Long-nosed Leopard Lizard, Gambelia wislizenii

The study habitat:

- Great Basin desert scrub, in the Alvord Basin, Harney County, Oregon.

Lizard Features:

Gambelia wislizenii are abundant top-predatory lizards. These ambush predators are easy to find, easy to capture, and remarkably easy to observe without affecting their behavior.

Principal prey of G. wislizenii:

Large insects, particularly grasshoppers, and other lizards, particularly Aspidoscelis tigris, the western whiptail lizard.

Some of the Basic Results

- Sex affects
  - Body Size: male = 97 mm ± 4 female = 101.5 mm ± 6
  - SVL means, sd
    - N = 21 M, 14 Ft = 2.5, p = 0.023

- SVL affects
  - Distance/move + Time/ move
    - F = 5.6, p = 0.016
    - F = 4.2, p = 0.052

- Sex + Moves/move
  - F = 2.0, p = 0.05
  - F = 0.72, M = 1.1

- Env Temps
  - Time spent being sedentary
    - warmer = longer F = 7.2, p = 0.015
    - F = 0.08, M = 0.06

- Time spent moving (excludes pursuit)
  - T = 2.3, p = 0.04

Distribution of Predatory Behaviors

(21 captures in 80 attempts by 3 individuals in mid-mornings)

Behavior used
- Captures/Attempts

Detection method
- All prey were seen by sedentary lizard
- Focal
- Leaping
- Lunge
- Run
- Climb

Conclusions

Observational-descriptive research on focal observations can reveal much about the animal, especially when other biotic and abiotic variables are also documented.

The food acquisition mode of the Gambelia wislizenii can be characterized as a short-wait ambush predator. In addition, food acquisition mode appears to vary among individuals and probably also varies according to the time of year when prey is available. More analysis among more abundant grasshopper prey and larger prey vary in availability should enhance understanding of the effect of prey availability on prey-seeking by the predator.

The predation behavior of this ambush lizard is remarkably cat-like; thus one can infer that there may be evolutionary conservation features common to these ambushial foraging strategies.