Using Student Generated Species Descriptions and Relationships to Test and Refine Understanding of Community Structure

Marianne Niedzlek-Feaver[1&2], Miriam Ferzli[2] , Brenda J. Grubb [3], Betty L. Black[3]

Zoology[1], Biological Sciences Interdepartmental Program[2], Zoology[3]

ACTIVITY

Students in an introductory biology course used pictures of imaginary creatures to construct species descriptions, and then use these imaginary species to build a viable community. Instructors may implement this exercise as an extension of the laboratory experience, as a bridge between lecture and laboratory, or in either the discussion or website component of a hybrid course. The activity was implemented in the latter format.

Students worked in groups to construct a species description that included typical growth and survivorship curves, life history characteristics such as fecundity, and any other characteristics that could help peers determine whether a species should be classified as a *K* or *r* selected species

Only enough "facts" accompanied the diagrams supplied to students to ensure that students would eventually be able to construct a viable community. For example, one species was described as

In class (about 30 students), each group had to defend their descriptions to other groups who critiqued and questioned facets of the description presented for each species. In the species 1 example (see example of student work), students used an unusual survivorship curve which they justified by proposing that the species was more bird-like, and birds often have a type two survivorship curve. Note this activity forces students to reflect on relationships between concepts such as the relationship between population growth, controlling agents, and *K/r* species characterization.

The class as a whole then had to build a community using these species descriptions. Each group built a food chain utilizing at least three class species other than those they produced. Groups in turn added their chains to those already drawn on the board, modifying characteristics, and adding other species of plants, and fungal and bacterial species, as needed, to produce a viable community. Any modifications and additions had to be justified to the class.

ASSIGNMENTS

Assignments were graded: 150 points of the 900 points that counted toward their grade was earned through classroom exercises and activities such as this one.

Example 1

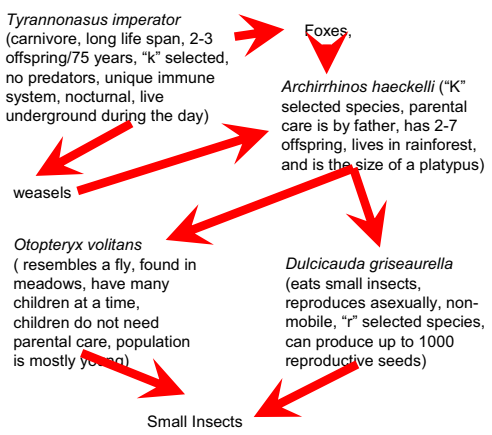
You must come up with a species description that is compatible with distributed images and an accompanying list of facts.
Your description must include a **survivorship curve** and a **typical population growth curve**. You will need to include an estimate of r while growing or at **least some estimate of fecundity**, and *K* if appropriate.

- **What is the proposed age distribution and how will this affect population growth?**
- **Is this species basically an *r* or *K* selected species?**
- **What possible factors, such as disease, predation, etc., could be controlling population numbers**.
- **Consider the species' niche or role in the community. What does it eat? Where does it live? Does it have any unique adaptation such as mimicry?**

Example 2

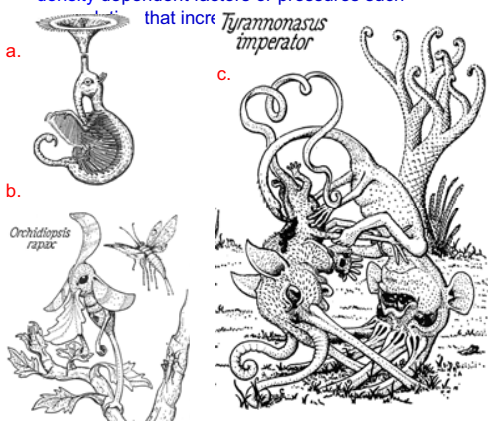
Construct a food chain centered around your two species. Add plants or other organisms as needed, but also try to use two or three other *snouter* species. As you construct the food chain, identify any interspecific competitors. Do they exhibit character displacement? What adaptations can you identify for predation or predator avoidance? What symbiotic relationships are there? What species would you add to your community to make it more realistic?

Example of a food chain constructed by students



Example of a species description constructed by students

Species 1: *Eledonopsis suavis* This species is a detritus feeder, more like a scavenger and it mostly feeds on fungi and pant material. It could grow up to 40 inches and may weigh up to 35-40 pounds, a size of a small dog. It usually stays in remote area forests in burrows and small caves or underneath rocks. It would usually breed about once every 18 months and reproduces about two to three offspring. It has long trunk like appendages in front of its mouth that it uses to catch food and also to fight off predators. This species will live up to 12 to 15 years before it dies of old age. The adults feed and take care of their young for a few years after they are born. The young usually mature at the age of five and tend to leave their parents at this age to survive and live on their own. This species would be considered a k-selected species and the survivorship curve would be similar to a type II curve. The population size would fluctuate close to the carrying capacity most of the time and the growth would be steady, since only a few individuals die at any age. Its most common predators are small carnivores such as hyenas, wolves, and coyotes. The species would have a logistic growth curve, "S-shaped", because it's growth is controlled by density dependent factors or pressures such that incr



Snouters taken from The Snouters by H. Stumpke. 1967. Doubleday. a. microscopic b. photosynthetic c.very large

Evaluation

Students responded to open-ended surveys relating to the learning value and effectiveness of various activities, including the "snouters." Qualitative analyses are in progress. Future evaluation of this project will use student survey responses and guided focus groups in a comparison study.

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