

Evolution and Biodiversity Laboratory

Activity: Using and Devising Taxonomic Keys

I. Using a Taxonomic Key

Work in pairs for this exercise.

Use of imaginary organisms eliminates preconceived notions and biases about classifications and evolutionary relationships. In today's exercises, **pasta** and **imaginary animals (Caminalcules)** on index cards will guide you through the process of using and creating taxonomic keys.

At your station are several containers of pasta "species" native to the United Aisles of Publix. The noodles have an evolutionary relationship to one another: They all are members **Order Semolina**, which evolved from a **hypothetical ancestor** resembling a **soda cracker**.

The taxonomic key is a tool that allows the user to identify the taxon of an individual organism. The key you will use today identifies each type of pasta to its genus and species.

Let's **key out** some pasta! Place one individual from each container in a plastic cup. Use the taxonomic key below to identify each pasta individual to its correct genus and species. At each dichotomy, choose the description that best matches the pasta you are identifying.

A NOTE OF CAUTION:

Be careful when choosing which of the two dichotomous character states your pasta actually exhibits.

What exactly is its skin? What comprises its body? What is its body form?

Confusing traits can lead to incorrect identification.

The caution above is true for keys used to identify real organisms, too. Character states are not always obvious, and some types of organisms are notoriously difficult to identify, even with an excellent taxonomic key.

So proceed with caution, and if you do make an error, go back and start from the beginning.

A TAXONOMIC KEY TO THE PASTA OF SOUTHERN FLORIDA

- 1a. Body tubular in shape 2
- 1b. Body not tubular 4

- 2a. Skin lined with small, symmetrical ridges 3
- 2b. Skin smooth *Ziti edulis*

- 3a. Anterior and posterior ends of organism slanted *Penna rigata*
- 3b. Anterior and posterior ends of organism
perpendicular to body axis *Rigatonii deliciosus*

- 4a. Skin lined with small, symmetrical ridges *Conchus crispus*
- 4b. Skin not lined with ridges 5

- 5a. Body cylindrical in overall shape *Rotinii spiralis*
- 5b. Body dorsoventrally flattened in shape *Farfalla aurea*

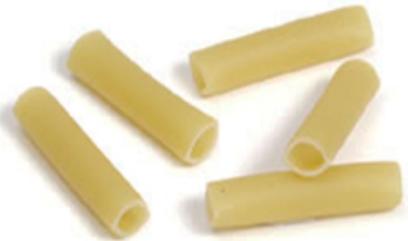
Write the name of each type of pasta underneath its picture below.



name:



name:



name:



name:



name:



name:

II. Devising a Taxonomic Key

Work in pairs for this exercise.

At your station you will find a set of eight cards bearing pictures of imaginary animals called **caminalcules**, invented and "evolved" by **J. H. Camin**.

(An "**animalcule**" is a small animal. See what he did there?).

Omit the OUTGROUP individual from your key. You will use it later.

Use ***A Guide to Greek and Latin Word Roots* by Donald J. Borror** to create a Latinized scientific name (consisting of genus and species) for each of your species. **(If you do not have a hard copy, your instructor can provide you with an electronic .pdf.)** Try grouping smaller sets of similar Caminalcule species together and assigning them to the same genus. (It is not likely that every Caminalcule belongs in its own genus!) Use proper *Systema naturae* rules in naming your species: Genus capitalized, species lower case, and name italicized.

Once you have named your caminalcules, create a dichotomous key to help an uninitiated person identify them to their correct taxon. Remember that each individual represents an entire species. Refer to the pasta key from the previous exercise to guide your organization. There's no single correct way to create a taxonomic key.

Although many keys reflect evolutionary relationships, this is not required.

Once you have finished your key, trade it AND the cards used to devise it with another team.

(Each team has a different set of Caminalcules, so you'll need to use the other team's cards, too.)

Using each other's keys, try to identify all of each other's species correctly. When you have identified them all, check with your "swap buddies" to see how well you did.

A [template](#) for creating a key for your caminalcules is linked to the online syllabus. It looks like the sample template below.

A Taxonomic Key for Identification of Caminalcules

1a. _____

1b. _____

2a. _____

2b. _____

3a. _____

3b. _____

4a. _____

4b. _____

5a. _____

5b. _____

6a. _____

6b. _____

7a. _____

7b. _____