

GRASSES, SEDGES, AND RUSHES

Dr. Craig

PURPOSE

Our goal will be to learn to recognize three very unusual and distinctive groups of plants: the grasses, sedges, and rushes.

DESCRIPTION

Grasses, sedges, and rushes are among the most advanced of plants. They have highly modified flowers that are not recognizable as traditional flowers, and they can be extremely difficult to identify. However, they are abundant and key components of ecosystems, so knowing about them is important.

METHODS

Using diagrams, descriptions, and dichotomous keys (list of either-or choices that assist with identifying your plants) you will determine which of a series of plants are grasses, sedges, or rushes. For each plant specimen, do the following:

1. Examine the seed heads of the plant under a dissecting microscope or hand lens.
2. Learn to recognize the structures depicted below.
3. Use your knowledge of the structures to interpret the key below.
4. Apply the following key to each plant you look at:
 - a. Flower with structures that look like sepals (modified leaves that are present below the petals of typical flowers. Stems are usually round in cross section- **Rushes** (*Juncaceae*).
 - a. Flowers without recognizable sepals.
 - b. Flowers or flower clusters (spikelets) with two highly modified leaves called **glumes** at their base. Glumes may hold one or more individual flowers, and each flower has two highly modified leaf-like structures called a **lemma** and **palea**. Within the lemma and palea, a seed may be found. Stems are usually round in cross section- **Grasses** (*Gramineae*).
 - b. Flowers consisting of a scale (modified leaf), beneath which a seed (**achene**) may be found, or the seed is encased in a papery sac (**perigynium**). Stems are often angled in cross section- **Sedges** (*Cyperaceae*).

Glumes	Seed				
Lemma	Palea	Scale	Achene	Perigynium	
	Grass		Sedge		Rush

EVALUATION

Your grade will be based on the number of plants you identify correctly.

MAKING A HERBARIUM SPECIMEN

Dr. Craig

PURPOSE

Our goal will be to learn to preserve plant material so that a permanent, mounted study specimen may be made from it. We will focus on trees that we studied in our last investigation. Once the herbarium specimens are prepared, we will use them in our next investigation to make a dichotomous key.

DESCRIPTION

Herbarium specimens are useful in documenting the structure and historic occurrence of plant species. Herbarium specimens collected in the 1600s are still in existence for scientists to study today. To prepare a specimen, it must first be dried in a plant press. Once dry, it can be mounted with special paper and glue and then labeled.

METHODS

1. Take the plants you collected in your last lab and arrange each between sheets of newsprint. Write on the newspaper the following:
 - a) identity of the plant,
 - b) date of collection,
 - c) location of collection,
 - d) what conditions were like at the collection site.
2. Place a piece of blotter paper over each, and then place the plant plus blotter paper between two sheets of corrugated cardboard.
3. Place all prepared plants and associated cardboard into a plant press- a device for flattening and drying plants. One of two sheets of wooden slatted boards forms the bottom of the press, and the other forms the top. The plants and cardboard go between these slats. Once assembled, take the plant press straps and pull them tight around the end boards.
4. After a week, the plant press can be disassembled and the plants removed for mounting. Take the dried, pressed plant out from the newspapers and put several dots of herbarium glue on their undersides. Lay the glued plant on a sheet of herbarium paper, arranging it so that it fits on the sheet.
5. Write out the following information on the lower right hand corner of the sheet, on separate lines:
 - a) identity of the plant,
 - b) date of collection,
 - c) location of collection,
 - d) what conditions were like at the collection site.
 - e) your name

EVALUATION

Your grade will be based on:

- a) Correct tree identification (30 points).
- b) Reporting all data required in step 5 above (20 points).
- c) Correct data reported for step 5 above (30 points).
- d) Preparing a specimen that fits on the paper (10 points).
- e) Preparing a specimen that shows both leaf and twig characters (10 points).

MAKING A DICHOTOMOUS KEY

Dr. Craig

PURPOSE

Our goal will be to learn to make a key that will assist with identifying trees. The key will be dichotomous, in that it will be a branching pattern of choices.

DESCRIPTION

Dichotomous keys are used to identify organisms. Organisms (in this case plants) are grouped by some characteristic, like leaf shape, and then organisms within each of the resulting groups are further divided by additional characteristics. Each section of the dichotomous key consists of a pair of choices, generally in yes/no format.

METHODS

Study the dichotomous key below copied from your lab on grasses, sedges and rushes. Use its format in making a key to identify the tree species collected during the previous class. Each criterion you use must be broken into a pair of choices. Examples of choice pairs you might use are 1) leaves opposite, leaves alternate; 2) leaves simple, leaves compound.

- a. Flower with structures that look like sepals (modified leaves that are present below the petals of typical flowers. Stems are usually round in cross section- *Rushes* (*Juncaceae*).
- a. Flowers without recognizable sepals.
 - b. Flowers or flower clusters (spikelets) with two highly modified leaves called **glumes** at their base. Glumes may hold one or more individual flowers, and each flower has two highly modified leaf-like structures called a **lemma** and **palea**. Within the lemma and palea, a seed may be found. Stems are usually round in cross section- *Grasses* (*Gramineae*).
 - b. Flowers consisting of a scale (modified leaf), beneath which a seed (**achene**) may be found, or the seed is encased in a papery sac (**perigynium**). Stems are often angled in cross section- *Sedges* (*Cyperaceae*).

EVALUATION

Your grade will be based on the number of trees you correctly identify to species using your key. You are to work in pairs, and each pair is to hand in one key. You and your partner must work independently from other groups. Keys from separate groups that are identical will receive no credit.