Using Dichotomous Keys
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Outline

1. Identification of Organisms
2. What Is a Dichotomous Key?
3. Examples of Dichotomous Keys
4. Activity: Plant Identification Using Dichotomous Keys
Identification of Organisms

- Correct identification is needed so that observations about a particular organism can be communicated.
- Biologists have developed taxonomic criteria for delineating species.
- Organisms are grouped/classified based on shared characteristics.
- Taxonomic keys have been devised to facilitate identification for people who are not all experts.

Remember that taxonomy is our human attempt to simplify/better understand nature and will always be somewhat artificial.
Classification of Organisms

Classification of organisms involves placing them into categories

Example 1: Seaweeds
Color is an important characteristic
Classification of Organisms

Classification of organisms involves placing them into categories

Example 2: Freshwater Plants
Habit is an important characteristic

http://aquat1.ifas.ufl.edu/
Dichotomous Key

Dichotomous = Divided into two parts

• A dichotomous key is a classification tool, used to sort, organize, and identify a collection of objects or living things

• A dichotomous key consists of a series of statements with two choices that describe characteristics

• Each choice leads to additional statements until arriving at the name of the organism being examined

• Characteristics can be quantitative or qualitative

• Careful observation of specimens is needed
Dichotomous Keys

• An individual key generally focus on a particular group of organisms and/or specific locations

• It is important to have the “right key” to identify a particular organism under study … otherwise, you will not make a correct identification!

• Some keys suffer from the use of imprecise terms; the best keys use objective, quantitative characteristics, rather than subjective ones

• After a tentative identification with a key, it is good practice to the species description to confirm the identification.
Dichotomous Key: A Fun Example – Norns

- Norns belong to the genus *Norno*
- Eight species of *Norno* that are generally located in specific regions of the world.
- A dichotomous key can be used to identify this species of norn.
A Dichotomous Key for Norns

1. Has pointed ears .............................................. go to 3
   Has rounded ears ............................................. go to 2

2. Has no tail ......................................................... kentuckyus
   Has tail ........................................................... dakotus

3. Ears point upward ............................................. go to 5
   Ears point downward .......................................... go to 4

4. Engages in waving behavior ...................... dallus
   Has hairy tufts on ears ................................. californius

5. Engages in waving behavior ...................... walawala
   Does not engage in waving behavior ...... go to 6

http://www.biologycorner.com/worksheets/dichoto.htm
# A Dichotomous Key for Florida Seagrasses

1. Leaves cylindrical ........................................................................................................... *Syringodium filiforme*, p. 261
2. Leaves flat, blade-like or strap-shaped ........................................................................... 2
2(1) Leaves strap-shaped, greater than 4 cm long ................................................................... 3
2(1) Leaves blade-like, ovoid, less than 4 cm long ................................................................. *Halophila*
   a. Leaves in pairs ................................................................................................................ b
   b. Leaves whorled at top of stalk ....................................................................................... *Halophila engelmannii*, p. 257
5. Leaves widely ovoid, 3–6 mm wide, 10–25 mm long; margins with extremely fine teeth .............. *Halophila decipiens*, p. 256
5. Leaves narrowly ovoid, 2–3(-4) mm wide, 5–25 mm long; margins smooth ....................... *Halophila johnsonii*, p. 258
3(2) Leaves 4–15 mm wide .................................................................................................... *Thalassia testudinum*, p. 259
4. Leaves less than 4 mm wide .............................................................................................. 4
4(3) Leaf apex tapering to one point or tooth, lateral veins obscure .................................. *Ruppia maritima*, p. 262
4(3) Leaf apex not tapering, leaf tip with three teeth (central tooth and two laterals) ........ *Halodule wrightii*, p. 260

Littler et al. 2008
**Example of Field Guide Information**

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**Codium decorticatum**

(Woodward) MA Howe 1911: 494

**Thallus:** highly variable from long and undulating, bushy, hemispherical to dome-shaped clumps, 25–50(-100) cm high, dark yellow-green to green; branching dichotomous to irregular, often prolific. Branches spongy, cylindrical, 6–25 mm diam., 6–9 cm long, flattened at dichotomies (occasionally throughout). Utricles cylindrical or club-shaped, 150–800 μm diam., 800–2000 μm long; apex wall 4–8 μm thick; hairs variable, up to 12 per utricle when present, in band 145–330 μm below apex. Gametangia oval, 58–125 μm diam., 144–390 μm long, stalked, 1–7 per utricle. Holdfast fibrous, pad-like.

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Littler et al. 2008
Example of Field Guide Information

**Locally abundant:** on rock or other hard objects such as oyster shells in protected areas, on beach rock in exposed habitats; lower intertidal to 25 m deep.

**Distribution:** Northern Indian River Lagoon, Mosquito Lagoon or on jetties at inlets (North Carolina to Florida, Bermuda, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico).

Type locality: Mediterranean Sea

Littler et al. 2008
Example of Field Guide Information

Note: Plants vary widely in physical form with older plants often extremely long, thickly branched with wide flattened areas. Younger plants or zones of rapid growth are often shorter, closely branched and more cylindrical.
Example of Field Guide Information

Codium decorticum

Thallus: highly variable from long and undulating, branched, hemispherical to dome-shaped clumps, 25-50×100 cm high, dark yellow-green to green; branching dichotomous to irregular, often prolific. Branches ovoid, cylindrical, 6-25 mm diam., 0-0 cm long, flattened along dichotomies occasionally throughout; thinner cylindrical or club-shaped, 150-800 μm diam., 800-2000 μm long, apex wall 4-8 μm thick, hairs variable, up to 12 per unit. When present, in band 145-180 μm below apex. Gametangia oval, 58-127 μm diam., 144-359 μm long, stalked, 1-7 per unit. Nodules fibrous, pedicellate.

Locally abundant: on rock or other hard objects such as oyster shells in protected areas, on beach rocks in exposed marine; lower intertidal to 3 m deep.

Distribution: Northern Indian River Lagoon, Mosquito Lagoon of estuaries at rivers (North Carolina to Florida, Bermuda, Bahamas, Greater Antilles, Lesser Antilles, Southern Caribbean, Western Caribbean, Gulf of Mexico).

Type locality: Western Atlantic (2-3).

Note: Plants vary widely in physical form with older plants often extremely long, thickly branching with wide flattened areas. Younger plants or ones of rapid growth are often shorter, closely branched and more cylindrical.
Activity:
Plant Identification Using Dichotomous Keys

Let's See If It Works!

Sometimes There Are Challenges!

Classify This!

http://www.glencoe.com/sec/science/biology/bio2000/biomovies/e20_1int.html
References/Additional Reading


Norns: Introduction to a fun dichotomous key
http://www.biologycorner.com/worksheets/dichoto.html

Plant Aquaculture Module

Activity: Plant Identification Using Dichotomous Keys