

Taxonomic Keys

Taxonomic keys are *aids for rapid identification of unknown plants*. They constitute important component of Floras, manuals, monographs and other forms of literature meant for the identifying plants.

Based on the arrangement of characters and their utilization, two types of identification keys are differentiated:

Single-access or sequential keys; and

Multi-access or multientry keys (polyclaves).

Single Access or Sequential Keys

Single-access keys are usual components of Floras, manuals, monographs and other books meant for identification. The keys are based on **diagnostic** (important and conspicuous) characters (**key characters**) and as such the keys are known as **diagnostic keys**. Most of the keys in use are based on pairs of contrasting choices and as such are **dichotomous keys**.

The construction of a dichotomous key starts with the preparation of a list of reliable characters for the taxon for which the key is to be constructed. For each character the two contrasting choices are determined (e.g., habit woody or herbaceous). Each choice constitutes a **lead** and the two contrasting choices form a **couplet**.

Based on the arrangement of couplets and their leads, three main types of dichotomous keys are in use: **Yoked or Indented key, Bracketed or parallel key, and Serial or numbered key**.

Yoked or Indented key: This is one of the most commonly used keys in Floras and manuals especially when the keys are smaller in size. In this type of key, the statements (leads) and the taxa identified from them are arranged in visual groups or yokes and additionally the subordinate couplets are indented below the primary one at a fixed distance from the margin, the distance increasing with each subordinate couplet. The following is an example of Indented or Yoked Key.

Fruit achene.
Calyx differentiated from corolla.
 Petal with basal nectary1. *Ranunculus*
 Petal without basal nectary2. *Adonis*
Calyx not differentiated from corolla.
 Plants woody4. *Clematis*
 Plants herbaceous3. *Anemone*
Fruit follicle.
 Spur present.
 Number of spurs 16. *Delphinium*
 Number of spurs 57. *Aquilegia*
 Spur absent5. *Caltha*

Bracketed or Parallel key: This type of key has been used in larger floras such as *Flora of USSR, Plants of Central Asia*, and *Flora of British Isles*. The two leads of a couplet are always together and the distance from the margin is always the same. Several variations of this are used wherein the second lead of the couplet is not numbered, as in *Flora of British Isles* or else the second lead is prefixed with a + sign as in *Plants of Central Asia*. The following is an example of bracketed Key.

1. Fruit achene..... 2
1. Fruit follicle 5
2. Calyx differentiated from corolla3
2. Calyx not differentiated from corolla.....4
3. Petal with basal nectary*Ranunculus*
3. Petal without basal nectary.....*Adonis*
4. Plants woody*Clematis*
4. Plants herbaceous..... *Anemone*
5. Spur present6
5. Spur absent..... *Caltha*
6. Number of spurs 1..... *Delphinium*
6. Number of spurs 5..... *Aquilegia*

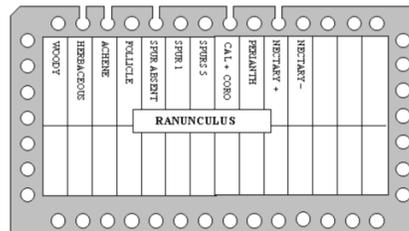
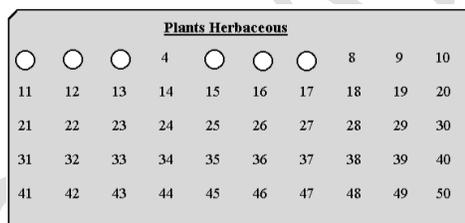
Serial or numbered key: Such a key has been used for the identification of animals and also adopted in some botanical works. This key retains the arrangement of Yoked key, but with no indentation so that distance from the margin remains the same. The location of alternate leads is made possible by serial numbering of couplets (or leads when separated) and indicating the serial number of the alternate lead within parentheses.

Multi-Access Keys (Polyclaves)

Such multientry order-free keys are user-oriented. Many choices of the sequence of characters are available. Eventually, it is the user who decides the sequence in which to use the characters, and even if the information about a few characters is not available, the user can go ahead with identification. Interestingly, identification may often be achieved without having to use all the characters available to the user. Such identification methods often make use of cards. Two basic types of cards are in use:

Body-punched cards

These cards are also named **window cards** or **peek-a-boo cards**, and make use of cards with appropriate holes in the body of the card. The process involves using one card for one attribute (character-state).



Left- A body-punched card for herbaceous habit for the seven representative genera of Ranunculaceae: **1-** *Ranunculus*, **2-** *Adonis*, **3-** *Anemone*, **4-** *Clematis*, **5-** *Caltha*, **6-** *Delphinium*, **7-** *Aquilegia*. Note the diagonal trim on upper left corner of card for proper alignment of cards. (For detail Please see the Recorded video of Online Class regarding this). **On Right-** Edge-punched card for genus *Ranunculus*. Only the attributes represented in the example above are pictured. Many more attributes could be added along the vacant holes to make the identification process more versatile.

Edge-punched cards

An edge-punched card differs from the body punched card in that there is one card for each taxon and holes are punched all along the edge of the card, one for each attribute. In our example here, we shall need seven cards, one for each genus. These holes are normally closed along the edge.