TAXONOMIC KEYS

A key is a device by which each specimen in a group of specimens may be identified. This can be achieved by presenting diagnostic characters in a series of alternative choices. The worker finds the correct name of his specimen by making the appropriate choice in a series of consecutive steps.

The use of keys in identification is old indeed. The classification of animals by Aristotle was usually presented in the form of simple dichotomous alternatives e.g., “bloodless versus with blood” etc. Voss (1952) gives an interesting history of the development of keys in systematic biology. Metcalf (1954) provides some hints for constructing keys.

The construction of keys is a laborious and time-consuming task, involving the selection and shifting of the most useful and clearly diagnostic characters. Ideal key characters apply equally to all individuals of the population irrespective of their age and sex. They are external and can be observed directly and without special equipment. Unsuitable key characters include those that require knowledge of all ages and stages of a species e.g., “sexual dimorphism present” versus “sexual dimorphism absent”; “darker versus lighter” etc. During the preparation of key the worker has the choice of several characters for the various levels of the key. The worker makes his best judgment in order to select the most satisfactory characters at its various levels. However, while making a key in a poorly known group (with many undescribed species) it is useful to arrange the key in such a manner that closely related species come out near one another. This facilitates the subsequent insertion of new species as well as the decision whether a species is new or not.

A good key is strictly dichotomous, not offering more than two alternatives at any point. The statements should be sufficiently definite to permit identification of a single specimen without reference to other species. Also the statements should apply to the given specimen without reference to the opposite sex or to immature stages. These should be treated in different keys. It is impossible to work out a key that permits the identification of all species. It is good to omit authorities from specific names in keys if these are mentioned elsewhere in the article. If the primary contrasting characters cannot be clearly seen due to damage of the specimen, the supplemental characters become desirable for diagnosis.

Types of Keys

Bracket Key: The most commonly used key by the taxonomists is the bracket key. This key has the advantage that the couplets are composed of alternatives which are side by side for ready comparison. It is also economical in space. It may be run forward or backward with equal facility by following the numbers which indicate the path that the various choices follow. The numbers in brackets are responsible for running backward

in the key. The best methods for assembling data for the construction of a key is shown in the following animals a fish, frog, snake, bat, bird and cat. One has to put up questions about them in such a way that only one of the two answers is possible i.e., yes or no or present or absent.

1. External ears present ……. 2
   External ears absent …….. 3

2. (1) Wings present ……. *bat*
   Wings absent …….. *cat*

3. (1) Wings present ……. *pigeon*
   Wings absent …….. 4

4. (3) Possess limbs ……. *frog*
   Limbs absent ……..…. 5

5. (4) Possess gills ……. *fish*
   Gills absent …….. *snake*

Indented Key: The other type of key is the indented key. It has the advantage that the relationship of the various divisions is apparent to the eye. But it is disadvantageous in that the alternatives may be widely separated and wasteful of space. For this reason it is generally used only for short keys, keys to higher taxa or comparative keys. A key based on the hypothetical data is given as follows:

A. External ears present
  B. Wings present ……. *bat*
  BB. Wings absent …….. *cat*
AA. External ears absent
  B. Legs present
    C. Wings present …… *pigeon*
    CC. Wings absent ……. *frog*
  BB. Without legs
    C. Possess gills …….. *fish*
    CC. Gills absent …… *snake*

Pictorial Key: The third type of key is the pictorial key which is designed for special purposes. This key is used by nonscientists for field identification. The critical characters are illustrated and described in such a way that they can be used by non-technical persons, engineers as well as entomologists. These keys have also been employed as field guides to higher taxa, vertebrates and flowering plants. A pictorial key for the larvae of class insecta is given as under (Figure...).