

Quadrant II – Transcript and Related Materials

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Notes

IDENTIFICATION AND CLASSIFICATION OF PLANTS

The three functions of plant taxonomy include identification, nomenclature and classification. The main aim of Plant taxonomy is to provide an ideal system of classification. Construction of an ideal system of classification necessitates a convenient method of identification description, nomenclature and tracing the natural affinities of a taxon as far as possible. The term taxon (pl.taxa of any rank eg. a species, a genus, a family and so on

IDENTIFICATION

The first and foremost aspect of the study. The identification or determination is recognizing of an unknown taxon is based on overall similarities and differences with an already known taxon. Proper and correct determination of a taxon is a prerequisite for any study based on it.

It is generally made by comparing the unidentified taxon directly with that of another already known taxon which has been authoritatively predetermined (a direct method) or with the help of the literature, keys, descriptions, illustrations etc. (an indirect method) and assigning a correct rank and position. Characters derived from gross morphology are sufficient for provisional determination but other characters are also considered.

Identification is

- Analysing relevant characteristics.
- Straightforward, easy.
- Reproducible.
- Fast.
- Inexpensive.

There are various methods of identification

1. Expert determination
2. Recognition
3. Comparison
4. Use of keys, synopsis, outlines etc

1. Expert determination

In terms of reliability and accuracy it is the best method of identification. Experts have prepared treatments such as monographs, revisions, synopsis etc. of taxa in question. It is probable that experts move concepts may be incorporated in recent floras or manuals. Experts are engaged in botanical gardens, herbaria, museums, universities, research organizations, colleges etc. Despite being reliable the method present problem of requiring valuable time by experts and creating delays for identification

2. Recognition

In reliability, recognition approaches expert determination as it is based on extensive past experience of the identifier with plant or plant group in question

3. Comparison

This method involves comparisons of a plant in question with identified and named specimens, illustrations, photographs or descriptions. Despite being reliable, the method is time consuming or sometimes becoming virtually impossible due to lack of suitable material for comparison. The reliability of the method depends on accuracy and authenticity of description, photographs or illustrations of named specimen used for consumption.

4. Use of keys, synopsis, outlines etc

By far, this is the most widely used. This method requires a long time and experience in comparison and recognition. Field guides help identify organisms - they highlight differences between similar organisms (like trees). In recent years, the method of taking photographs of plants and plant parts, uploading this picture on the website and making an enquiry from the concern electronic list and newsgroup to look at the photographs and send their comments to enquirer is gaining popularity. After an unknown specimen has been provisionally identified with the help of key its identification can be further confirmed with detailed description of the taxon provided in the literature sources employed. Floras, monographs, manuals and identification are important sources of literature.

In case specimen in question does not agree or compare with existing predetermined specimen. It is taken to be a new to science and this is the most exciting situation for a taxonomist to discover a new taxon.

CLASSIFICATION

The ability to classify objects and phenomena is an important human. Our ability to distinguish food from poisons, friend from foe, useful substances from those of no value, is as vital today as it was in the Stone Age. The earliest plant classifications were probably similar to those of present day folk cultures or tribal people. These classifications categorise plants according to their useful properties. However, the botanists were only using characteristics that they could see (**morphological features**), and deciding which differences were important and which to ignore was purely speculative and based on the prejudices of individuals.

The first written classifications still in existence are those of the Ancient Greek authors such as Theophrastus (370-285 BC) and Dioscorides (c.40 – c.90 AD).

Theophrastus provided a rudimentary plant classification based on the 500 plants in the botanic garden at Athens. Dioscorides' book *Materia Medica* was the first known herbal, and the only one for about 1000 years.

In his *Historia Plantarum* he had classified and described about 500 cultivated plants into herbs, under-shrubs, shrubs and trees. He considered trees to be highest evolved while herbs very primitive, distinguished between annual, biennial and perennial plants. His classification was strictly artificial. He noted the difference between centripetal and centrifugal inflorescences. Characters considered for delimitation of taxon mainly comprised centrifugal and centripetal inflorescences, hypogynous, perigynous and epigynous condition of flowers and union of floral leaves into gamopetalous or free floral leaves as polypetalous condition.

The plants listed in his *Historia Plantarum* claim to indicate distinction between dicotyledons and monocotyledons. The scientific study of plant classification in Europe began properly in the 18th century. The Swedish botanist Carolus Linneaus (1707-78) is credited with establishing the naming system that we use today for all living organisms. Classification is the process of grouping things together on the basis of the features they have in common. Arranging/ordering/grouping organisms into orderly groups according to their resemblances on the basis of shared properties and functions in particular taxon. The study of plant classification is known as taxonomy ('taxon' means 'group') and it is done by specialized botanists called 'taxonomists' who are scientists who specialize in identifying & naming and classifying organisms. There are a billion known species of organisms and only a very small percentage of organisms are identified and classified. New organisms are still being found and identified. Keeping in view an enormous number of species of plants on this planet, it is impossible to study them individually.

And thus it becomes necessary to study them in an organized manner and placed them into small or large groups or their similarities and differences. These groups, the taxa are then arranged in a sequential order into categories according to their levels. Each category is given a name following the rules of nomenclature the similar plants are grouped under species similar species under genus, similar genera under a family and so on in sequence of increasing inclusiveness. Thus classification is an arrangement of organisms into groups on the basis of similarities by rank or position and placing them within the taxonomic hierarchy following a certain criteria.

The groups are in turn assembled into more inclusive groups until all the organisms have been assembled into a single most inclusive group. In sequence of increasing inclusiveness, groups are assigned to a fixed hierarchy of categories such as species, genus, family, order, class and division, and the final arrangement constituting a system of classification.

The process of classification also includes assigning appropriate position or rank for a new as well as old taxon dividing a taxon into smaller units, a taxon that has been recommended, splitted, united, transferred or altered in rank. Once established a classification provides an important mechanism and source of storage retrieval and usage of information of organisms. It also includes the determination of position or rank for a new as well as old taxa that have been recommended, splitted, united, transferred or altered in rank.

Benefits of Classifying

Accurately & uniformly names organisms

Prevents misnomers such as starfish & jellyfish that aren't really fish

Uses same language (Latin or some Greek) for all names