

## **WHY STUDY SYSTEMATICS?**

Systematics is important in providing a foundation of information about the tremendous diversity of life. Virtually all fields of biology are dependent on the correct taxonomic determination of a given study organism, which relies on formal description, identification, naming, and classification. Systematic research is the basis for acquiring, cataloguing, and retrieving information about life's diversity. Essential to this research is documentation, through collection and storage of reference specimens, e.g., for plants in an accredited herbarium.

Systematics is also an integrative and unifying science. One of the aspects of systematics is that it may utilize data from all fields of biology: morphology, anatomy, embryology, ecology, geography, chemistry, physiology, genetics, and molecular biology. The study of systematics provides the scientific basis for defining species and infraspecific taxa (subspecies or varieties) and for establishing that these are distinct from other, closely related and similar taxa. Such studies are especially important today in conservation biology, in order to determine whether a species or infraspecific taxon of plant is rare or endangered and warrants protection. Systematics, which has been called simply the study of biodiversity, is the major tool for documenting that biodiversity and can be a major tool for helping to save it.

### **Characters used in Plant Taxonomy:**

#### **1-Cell Structure:**

The cytotaxonomy and Chemotaxonomy locate under cell structure; involve qualitative and quantitative structure of cell sap components and the different parts of living and non-living of the cell.

## **2- Arrangement, Types and Morphology of Cells:**

This has an important role in the different taxonomic categories, as well as the position and nature of the cells and their functions, all these characters locate under plant anatomy.

## **3- Presence or absence of certain tissues and organs:**

This has an important in separation many plants in the different taxonomic categories, such as the presence of vascular tissues (vascular plants) and flowers (flowering plants).

## **4- Similarity and dissimilarity of reproductive structures:**

The flowers, for example differ in their shapes, colors and dimensions in the different flowering plants, therefor, the different floral parts especially the fertile ones used in the separation these plants from each other to orders, families and other small taxonomic categories.

## **5- Gross Morphology:**

These characters have a large importance in the identification the different taxonomic categories such as the family, genus and species, where the different shapes, colors and dimensions of stems and leaves, flowers positions and their arrangement, fruit and seed types and their variations, all these characters separate the different plant species from each other.

## **6- micro-morphology:**

Such as the study of external features of seeds and pollen grains and determination of the surface ornamentations of these plant parts.

The taxonomic studies appeared that the reproductive organs have an important role in separation the plant species because of the fixative characters of these organs, therefor, today become one of the important things that use in the taxonomy of flowering plants.