Introduction to plant Taxonomy (Identification, Classification and Nomenclature) : Various systematic activities are directed towards the singular goal of constructing an ideal system of classification that necessitates the procedures of identification, description, nomenclature and constructing affinities. This enables a better management of information to be utilized by different workers, investigating different aspects structure and functioning of different species of plant. The different components of systematics are as follows:-

Identification :- Identification or determination is recognizing an unknown specimen with an already known taxon, and assigning a correct rank and position in an extant classification. In practice, it involves finding a name for an unknown specimen. This may be achieved by visiting a herbarium and comparing unknown specimen with duly identified specimens stored in the herbarium. Alternately, the specimen may also be sent to an expert in the field who can help in the identification.

Identification can also be achieved using various types of literature such as floras, monograph or manuals and making use of identification keys provided in these sources of literature.

Description :- The description of a taxon involves listing its features by recording the appropriate character states. A shortened description consisting of only those taxonomic characters which help in separating a taxon from other closely related taxa, forms the diagnosis, and the characters are termed as diagnostic characters. The diagnostic characters for a taxon determine its circumscription. The description is recorded in a set pattern. For each character, an appropriate character state is listed. Flower colour (character) may thus be red, yellow, white, etc. (states). The description is recorded in semi-technical language using specific terms for each character state to enable proper documentation of data.

Nomenclature: - Nomenclature deals with the determination of a correct name for a taxon. Nomenclature of plants is governed by the International Code of Botanical Nomenclature (ICBN) through its rules and recommendation. Updated every six years or so, the Botanical Code helps in picking up a single correct name out of numerous scientific names available for a taxon, with a particular circumscription, position and rank. To avoid inconvenient name changes for certain taxa, a list of conserved names is provided in the code. Cultivated plants are governed by the International Code of Nomenclature for Cultivated Plants (ICNCP) slightly modified form and largely based on the Botanical Code.

With the onset of electronic revolution and the need to have a common database for living organisms for global communication a common uniform code is being attempted. The Draft BioCode is 1stpublic expression of these objectives. The first draft is prepared in 1995. After successive reviews the fourth draft, named Draft BioCode (1997) prepared by the International Committee for Bionomenclature was published by Greuter et. al. (1998) and is now available on the web. The last decade of the twentieth century also saw the development of rankles phylocode based on the concept of phylogenetic systematics. It omits all ranks except species and clades based on the concept of recognition of monophyletic groups.

Classification: - Classification is an arrangement of organisms into groups on the basis of similarities. The groups are in turn assembled into more inclusive groups , until all the organisms have been assembled into a single most inclusive group. The process of classification includes assigning appropriate position and rank to a new taxon, dividing a toxon into smaller units, uniting two or more taxa into one, transferring its position from one group to another and altering its rank. Taxonomic entities are classified in different fashion:-

- **Artificial classification** is utilitarian, based on arbitrary, easily observable characters such as habit, colour, number, form of similar features. The sexual system of classification of Linnaeus fits in this category.
- **Natural classification** uses overall similarity in grouping taxa, a concept initiated by M. Adanson and culminating in the extensively used classification of Bentham and Hooker. Overall similarity in this system is judged on the basis of features derived from all the available fields of taxonomic information (Phenetic relationship).
- **Phenetic classification** makes the use of overall similarity in terms of a phonetic relationship based on data from all available sources such as morphology, anatomy, embryology, phytochemistry, ultrastructure and, in fact, all other fields of study. This classification is strongly advocated by Sneath and Sokal (1973).
- **Phylogenetic classification** is based on the evolutionary descent of a group of organisms, the relationship depicted either through a phylogram, phylogenetic tree or a cladogram. Classification is constructed with this premise in mind, that all the descendants of a common ancestor should be placed in the same group (i.e. the group should be monophyletic). If some descendents have been left out, rendering the group paraphyletic, these are brought back into the group to make it monophyletic. Similarly, if the group is polyphyletic with members from more than one phyletic lines, it is split to create monophyletic taxa. This approach , known as **cladistics**, is practiced by **cladists**.
- **Evolutionary taxonomic classification :-** It differs from phylogenetic classification in that the gaps in the variation pattern of phylogenetically adjacent groups are regarded as more important in recognizing groups. It accepts leaving out certain descendants of a common ancestor if the gap are not significant, thus failing to provide a true picture of the genealogical history. The characters considered to be of significant in evolution are dependent on expertise, authority and intuition of

systematists. Such classification has been advocated by Simpson (1961) Mayr and Ashlock (1991). The approach, known as **eclecticism**, is practiced by **eclecticists.**

Classification not only helps in the placement of an entity in a logically organized scheme of relationships, it also has a great predictive value. The presence of a valuable chemical component in one species of a particular genus may prompt its search in other related species. The more a classification reflects phylogenetic relationships, the more predictive it is supposed to be.