**pharmacognosy**

**Lec. 4 2016-2017 Assistant Lecturer**

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**Plant Nomenclature & Taxonomy**

The present plants nomenclature depends on the binomial system that belong to the great Swedish biologist Linnaeus ( 1707- 1778 ) , in which the first name denotes the genus , that begins with a capital letter , while the second ( specific ) name denotes the species and begins with a small letter .

The specific name is usually chosen to indicate some striking characters of the plant. A particular species can also exhibit a number of varieties; these are especially evident with cultivated plants but are also found in the wild.

The modern rules governing the terminology of plant taxonomy are laid down in the (International Code of Botanical Nomenclature).

**Subdivisions of The Phyla:**

The main hierarchical subdivisions of a division, arranged according to Englers Scheme, may be illustrated by the following example showing the systematic position of peppermint.

Ex : **( *Mentha piperita* )**

**Division :** Angiospermae

**Class:** Dicotyledoneae

**Sub class**: Sympetalae

**Order:** Tubiflorae

**Sub order**: Verbenineae

**Family:** Labiatae ( Lamiaceae )

**Sub family:** Stachydoideae

**Tribe:** Satureieae

**Genus:** Mentha

**Species:** *Mentha piperita* Linnaeus (Peppermint)

**Varieties:** *Mentha piperita* var. *officinalis* Sole (White Peppermint)

*Mentha piperita* var. *vulgaris* Sole (Black Peppermint).

It will be noted that in Pharmacopoeias & in research publications botanical names are followed by the names of the Scientists or botanists (e.g. Linnaeus and Sole in the case of peppermint given above). These refer to the botanist who first described the species or variety.

**Botanical Systems of Classification**

During the last 100 years a considerable number of phylogenetic systems of classification have been propounded; these systems arrange taxa (any group used for classification such as orders, families, genera, etc.) to indicate the possible relationship of one taxon to another. Such system is clearly susceptible to change with increasing knowledge, and no final system acceptable to all taxonomists is in sight, indeed for some practical purpose a stable, workable phonetic system is often preferable. A close examination of the phylogenetic systems reveals that certain taxa from species groups, others have less well – defined boundaries and other groups are difficult to accommodate phylogenetically.

**Taxonomic Characters**

All plants possess hundreds of characters of a morphological, histological, embryological, serological, chemical and genetic nature which are potentially available for building up a classification of the plant kingdom. In the artificial schemes the characters employed were those that experience had shown which could be used to produce suitable groups or taxa.

Phylogenetic classifications, which Endeavour to indicate the relationship of one taxon to another, imply the use of characters that are capable of showing such relationships.

The taxonomist then has to be considering whether each character should be given equal value or whether a weighting system should be employed. Computers have an obvious role in dealing with large numbers of characters applied to thousands of plants, not only from the aspect of storage and retrieval of information , but also include the science of numerical taxonomy , which will probably play an increasing role in the development of systematics.

**Chemical Plant Taxonomy**

The concept that plants can be classified on the basis of their chemical constituents is not new; for example, early workers classified the algae into green, brown, and red forms, but it's only during the last 40 years that included modern techniques of isolation and samples. Compared with morphological characters, chemical constituents are often more precisely definable and can be of more fundamental significance for classification purposes. Plant taxonomists , in general hold the view that chemical characters are yet another type of character to be considered alongside those used traditionally , but it does not necessarily follow that taxa constructed on a purely chemical bases , if such were possible on the present available data , would necessarily coincide with those arrived by classical methods .

The characters employed in chemical taxonomy need to be those of intermediate distribution in the plant kingdom. The presence of such ubiquitous compounds as the essential amino acids and common sugars is of little diagnostic value and at the other extreme, the occurrence of coniine in the single species *Conium* *maculatum* of the large family Umbelliferae is also of little taxonomic significance .Characters most studies in this connection are therefore secondary metabolites (alkaloids, isoprenoids, flavonoids, characteristic glycosides, etc.) may of which are of established pharmaceutical interest.

Recent examples of the correspondence of genetic profiles and chemical constituents for the delineation of closely related plant species and chemotypes is illustrated by research on *Withania somnifera* , *Zingiber officinalis* and related species and *Hypericum* spp.

Serotaxonomic studies of Acacia gum exudates have demonstrated the value of immunological tests in the chemotaxonomic analyses of these economically important products.