Plant taxonomy or Systematic botany

A study of the grouping of plant together and study their diversity and identification, classification and naming. The classification (is arrangment of the plants into hierarchy having common characteristics. Each level of hierarchy is called a rank or category e.g. family, genus, species.

A taxonomic element or classificatory unit of any level or rank may be species, genus, family ... ect. it is called – a taxon (pl. taxa) e.g. Brassicaceae, Brassica.

So that systematic or taxonomy these two terms are often used as synonymously.

Nomenclature:

So that the study of the naming of taxa is known as nomenclature and the rules concerning it have been formalized in the "international code of Botanical nomenclature "ICBN")). It requires that scientific names are in Latin form and that they are subject to the rules of " as grammar and written in "latin."

The information here is taken from the code adapted by the 12th international Congres in Leningrad " 1975 and publised in 1978."

* The basic rank of the hier. chy is the "species".

A species: is defined as a group of plant which can interbreed together and form fertile offspring.

Species are grouped into genera – Singular genus

Genus: are grouped into families – Singular family, such as Cruciferae and Gramineae.

family: are grouped into Orders. Order are grouped into Clases.

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<u>Classe</u>: are grouped into Division.

There are other categories, below each rank these can be a group using the "Prefix" <u>sub</u> - as in subdivision, sub class, subfamily, subgenus; and <u>between</u> the genus and the species is the section.

※   <u>Below</u> the species is the <u>subspecies</u>: <u>Variety</u> and <u>Form</u>

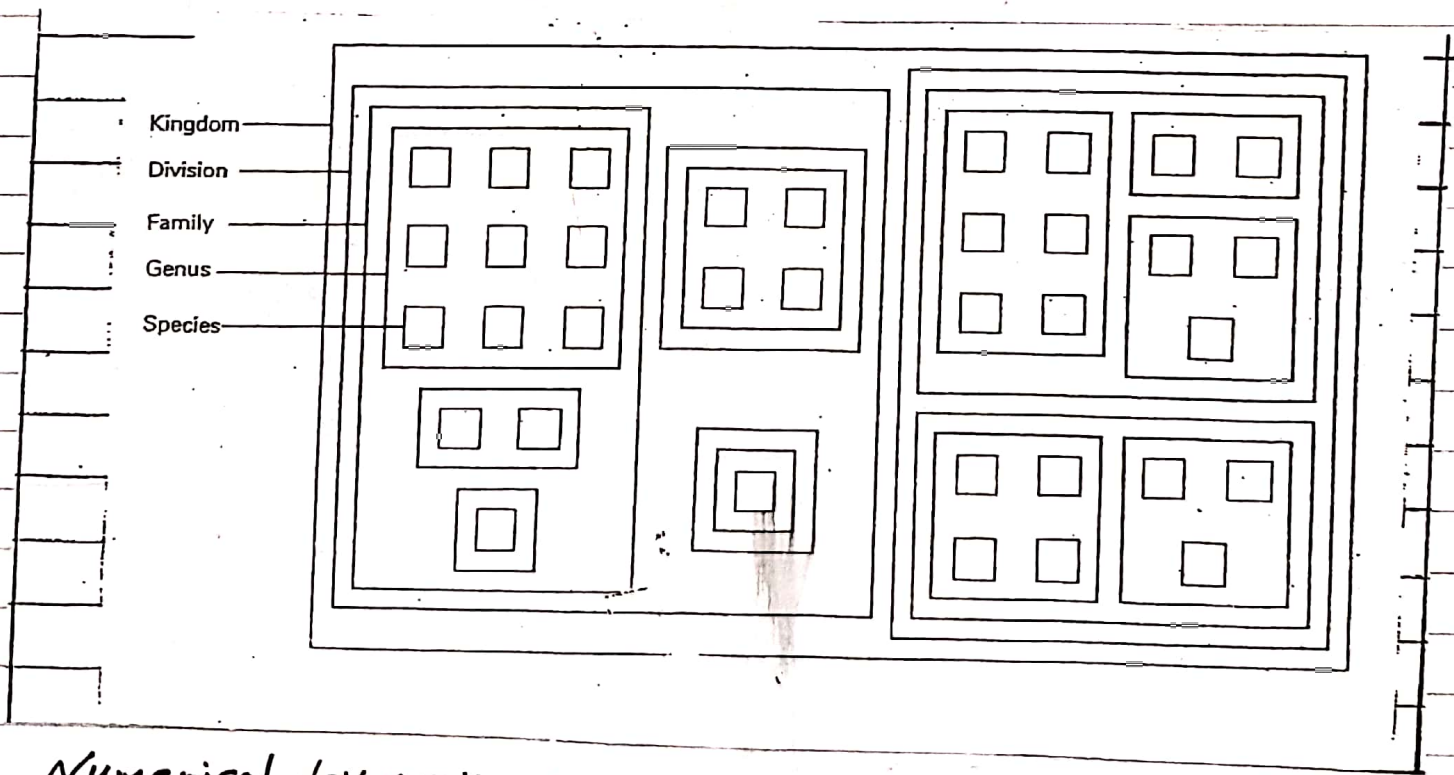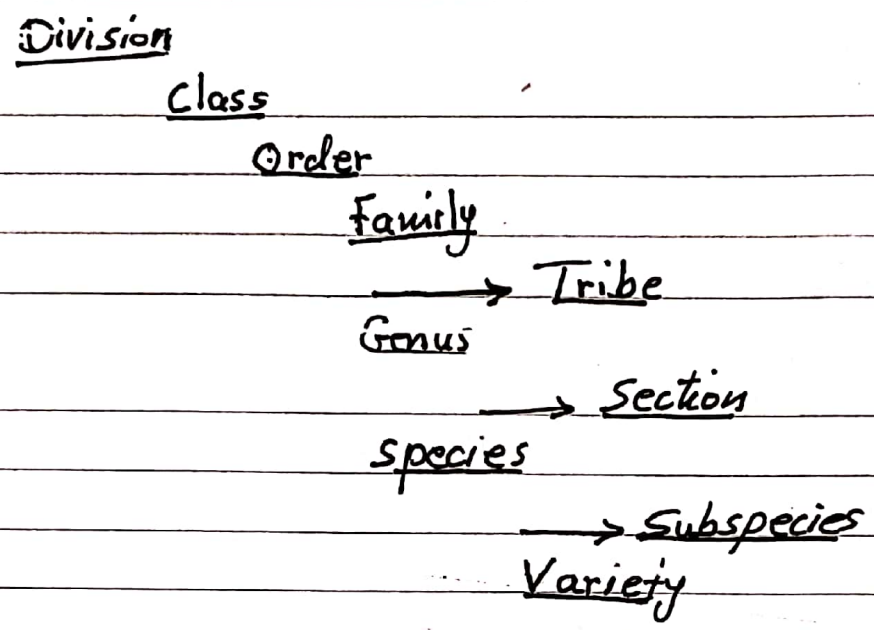فيما يلي جدول يوضح المراتب التصنيفية مع مثاله لكل منها :

Rank المرتبة	Ending النهاية	Example مثال
Division	-phyta-mycota - "Fungi"	pterophyta - Eumycota
Subdivision	-phytina-mycotina " Fungi"	pterophytina, ,Eumycotina
Class	-Opsida - phyceae" Algae	pteropsida, Cyanophyceae
Order	-ales	Rosales
Suborder	-ineae	Rosineae
Family	-aceae	Rosaceae
Subfamily	-Oideae	Rosoideae
Tribe	-eae	Rosaeae
Genus	us ; a ; -um ;-es ; on elt.	Rosa ; Nerium ; plantanus ; ...ect.

<u>Biosystematics</u>

is the broad field concerned with the involves ecological, Cytological, morphological, molecular biology, phylogentical, embryological and genetic investigation ...etc, and experimental science studies of living population in the field experimental, garden, Laboratory and green house, so that this science

to gave the taxonomist more evidence for the classification by using these characters to study phylogentic relationship.

The important ranks of the taxonomic hierarchy :

<u>Division</u>
      <u>Class</u>
          <u>Order</u>
              <u>Family</u>
             ⟶ <u>Tribe</u>
            <u>Gonus</u>
                 ⟶ <u>Section</u>
              <u>Species</u>
                 ⟶ <u>Subspecies</u>
              <u>Variety</u>

Kingdom
Division
Family
Genus
Species

<u>Numerical taxonomy</u>
is the treatment of various types of taxonomic data by Computerized methods.

Sources of the evidences

Or the relationship between systematic and other Sciences : علاقتة علم التصنيف بالعلوم الأخرى

Such as ....

1- Morphological evidences   الصفات , أو الدلة الخارجية
2. Anatomical evidences   الأدلة التشريحية
3- Chemical evidences   الأدلة الكيماوية
4- Cytological evidences   الأدلة الخلوية
5- Genetical evidences   الأدلة الوراثية
6- Palynological evidences   أدلة حبوب اللقاح
7- Embryological evidences   أدلة الأجنة
8- Phylogentic evidences   أدلة التطور السلفى
9- Ecological evidences   الأدلة البيئية
10- Geogriphical evidences   الأدلة الجغرافية

or

Geogriphical distribution   أو أدلة التوزيع الجغرافى
11- Paleobotanical evidences   أدلة المتحجرات النباتية
12- Physiological evidences   الأدلة الوظيفة
13- Molecular Biology evidences   أدلة البيولوجى الجزيئى

1- Morphological characters

The feature of floral morphology are the most important characters in the classification of flowering plants:

① These features are easily observed.
② They are partical for use in Keys and descriptions.
③ Morpholog currently provides → most of the characters used in constructing taxonomic systems.

For example:

If you are take one part of the plant such as leaf.
. you can study many characters as concens of leaf like:

Leaf - shaps , leaf-base , Leaf-Apex , leaf-margin , leaf-arrangment, on the stem and leaf-venation ---et.

also for example the Flower ...ect.

But the evolutionary lines of the flowering plant, is should not be expected that all the morphological characters should occur uniform among all species .

④ Anyway the morphological characters with some taxa are of little taxonomic value, but in other taxa they can be of major vegetative feature. But the difficulties of morphological characters the determination which one is primitive and which one is Advanced .

2- Anatomical characters

The application of anatomical data to the solution of taxonomic problems. The similar leaves of Acer and plantanus for example, have different anatomical features on the other hand the absence of ;

———> Conducting tissues in water plants and the presence of

———> bicollateral vascular bundle in climbing plants .

———> also valuable taxonomic evidences has been stained

———> from the study wood-structure, leaves-epidermis and stomata ... ect. as constant and useful characters in plant taxonomy.

Also other example have different anatomical feature in Euphorbia, all species are characterized by the present of, Latex - Vessels, whether the plant be cactus - like, thorny, shrubs or leaf herbs.

Among the many taxonomically important features of stomata, the arrangment of the surrounding epidermal cells (termed subsidary cells) They are distinct from the normal epidermal cell, is the most valuable and their are about thirty one distinct patterns have been found in the vascular plants.