LECTURE 6: Taxonomic hierarchy

Just as a continent is divided into various nations, nations into countries, countries into states, states into provinces or local goverment areas as in Nigeria, Provinces into divisions, divisions into distinct etc. Similarly, the plant kingdom is divided into a number of categories which differ in size, rank and nature when these categories are so arranged, they constitute the taxonomic hierarchy, the list of categories into which plants are classified is known as Taxonomic hierarchy Any of these groups at any level, may be referred to as taxon (plural taxa).

Taxon is the different categories in a system of classification e.g family, order, specics etc.

Description : A desicripti of a taxon is the statement of it's character i e is the description of characteristics of the tixon and is also known as taxonomic characters.

Hierarchy: classification places plant in categories or steps or ranks that often procede each order in order to make it easy to make reference to them. The categories form an hierarchy to them. The categories form a hierarchy in which in turn contains other smaller components in a seeming descending order. The International Code of Botanical Nomenclative (ICBN) recognizes 12 main categories in the hierarchy of all plant kingdom. The acceptable system of Nomenclature provides a hierarchical arrangement of the rank of taxa in an ascending sequence e.g species, genus, family, order, class and division each with sub categories. The rank represents level of relationships required for classification purposes in treating different group of plants.

Ranks in Taxonomic hierarchy

1. Kingdom

2. Division - classes are grouped into divisions or phyla
3. Class - consists of group of related order.
4. Order
5. Family
6. Tribe
7. Genus (generic name) plural genra
8. Section
9. Series
10. Species (specific name)
11. Variety
12. Form

Form : A group of individuals give rise to Form

Variety : is a group of plants within a species with identical properties or characteristics

Species : A Species is a group of organisms having close resemblance with each other both structurally and functionally.

S**eries** A group of closely related species form series.

Section: A group of closely related series from a section.

Genus: A group of closely related sections from a Genus (Generic name)

Order: is a major taxon immediately superior to the family and it will formed the name of the order by adding ales to stem of the included generic name e.g poales, malvales(cotton). A group of closely related family form an order.

Family: it consists of groups of related genera e.g Hibiscus family is composed of many genera, among which is the cotton *Gossypium*, okro genus. Hibiscus- the name ending aceae poaceae, Fabaceae

Sub family: is a major sub division of the family is sometimes used when the six of the family justifies it. The name is ending with 'Oldeae' panicoldeae

Tribe: is a sub division of the family panicoldeae but subordinate to the sub-family. The tribe name is ending with 'eae' Festhceae- grass family.

Class: consists of group of related orders. A number of class share a great deal of diversity but do have a specific set of characters in common.

Division: is the categories of highest magnitude with the plant kingdom. It is characterized by a few very specific features and its members share all these traits, but may be much diversified. Thus, the whole idea of taxonomic hierarchy can be best described in form of a box-in-box manner.

DESCRIPTIVE FEATURES OF PLANT TAXONOMY

The following sequence is commonly followed when describing a flowering plant.

1. **Habitat**- is the natural abode of the plants ornamental, cuttivated or wild plants.

2. **Habit**- is the growth form e.g a). herb, shrub, or tree b). annual, biennial or perennial

3. **Root system** – top root or adventitious

   Branched or unbranched

Modification- Fibrous, prop, aerial etc

4. **Stem system**- - erect, weak, stem climbing/ twining,

-modification such as rhizome, tuber, bulb, runer

-branched and unbranched or mode of branching

-shape cylindrical angular, Hairy or glabrous

5. **Leaf system** - Alternate, opposite or whorled

-Staled or sessile

- Ventation of leaf

-Kind of leaf – simple or compound

-Texture

-Apex as acute, acuminate or obtuse

- Leaf lamina – linear, oval, ovate, lanceolate

6. **Inflorescence system**-simpler or compound, panicle, spike.
7. **Flower system** - pedicellate or sessile

-bracteate, ebracteate or bracteal

-complete or in complete, bisexual or unisexual

-regular or irregular hypogynous, epigynous or perigynous

8. **Perianth** – present or absent. If present, then their aestivation and fusion e.g gamophylous or polyphyllons and sepaloid, petaloid or all alike. When the calyx and corolla are fused and could not differentiated usually of the same colour. The individual unit is called **Tepals.**

9. **Calyx-** made up of individual unit called **sepals** which could be free (polysepalous or fused gamosepalous. The number of sepals making up the calyx, the shape, size and colour are very tendrils. Importantt consideration –number and shape of sepals, (b) free or fused (c) persistent or caducous (d) aestivation such as valvate, inbricate or contorted.

10. **Corolla**- Number and shape of petals (b) free or fused (c) aestivation of corolla, (d) colour of the petals

11. **Androecium** – Is the general name of male part. The individual is called microsporophy or stamen. The anther can be labeled pollen sac.

- consider the nos of stamen.
- consider the free or fused
- consider filament short or long.

12. **Gynoecium-** Pistil is the female part and made up of individual units called carpels, stigma style and ovary.- Consider the number of carpels, - Consider free or fused carpels - Consider ovary superior or inferior, - Consider placentation- Consider number of loculli, - Consider style free or united. If an ovary is on top of the receptacle is superior and if otherwise it is interior

13. **Fruit-** nature and dehiscence of fruits