SBEL 1532
HORTICULTURE AND NURSERY

Lecture 2:
Plants' Classification & Taxonomy

Dr.Hamidah Ahmad

CC BY NC SA

Plant Classification

Plant Classifications is based on :

1. **botanical type**
2. **values or geographical or ecological communities**

Purpose of classifying plants:

It is to **ensure that the right plants is correctly named or identified regardless of where one is on earth.**

Plant Classification

Plants in horticulture are normally classified according to their **botanical characteristics**.

Plants are either **herbaceous or woody.**

Herbaceous plants are plants

- with **softer** stems
- more **succulent** and
- **less fibrous** compared to woody plants.

Plant Classification

Woody plants can also be grouped as **deciduous** or **evergreen**.

The **evergreens** are plants that retain living leaves at all times (all year round).

Deciduous plants are those without leave during winter in temperate climate or during the dry season in the tropical climate.

Plant Classification

In some cases, plants are classified according to their **vegetative habits;**

That is based on their life cycle.

Three most common classifications are:

1. **Annuals:**

These are plants that complete their life cycle,

seed - plant - seed

during a single season.

They are normally herbaceous.

Plant Classification

2. **Biennials:**

These are plants that require **two years** to complete their life cycle. They are normally herbaceous.

3. **Perennials:**

These plants that are long lived, more than two years and are usually **woody or herbaceous.**

Plant Classification

What is Plant Taxonomy?

Plant Taxonomy is a system for classifying plants based on their

1. **Genetic and**
2. **Evolutionary relationship**

- Plant Taxonomy is not a fixed science
- It continues to change as new information becomes available.

-This is so partly because of the ever going evolution process that develop within each species due to genetic, ecological and physiological-biochemical changes/ influences.

Botanists who are interested or involved in this work are called **taxonomist.**

Plant Classification

There are various methods of classifying plants have been used throughout history. Some have been mentioned earlier.

One is that of a man named Carolus Linnaeus (1707 – 1778)
He revolutionized plant classification and gave form to the scientific system currently used.

Plant Classification

1. Plants are classified within a **KINGDOM.**

It is called the Plant Kingdom.

This current system of classification of plants is a natural system which is based on the evolutionary relationship among plants.

2. Plants are further subdivided into major **DIVISIONS**. The plants are separated based on the evolutionary relationship basis.

Plant Classification

Example of the categories and subcategories of the Plant Kingdom is as follows;

KINGDOM
DIVISION
CLASS
ORDER
FAMILY
GENUS
SPECIES

Plant Classification

Category	Scientific Name	Common Name
Division	Myxomycophyta	
Division	Schizophyta	Blue-green algae and bacteria
Class	Schizomycetes	Bacteria
Class	Cyanophyceae	Blue-green algae
Division	Chlorophyta	Green algae
Division	Euglenophyta	Euglenoids
Division	Chrysophyta	Golden-brown algae and diatoms
Division	Pyrrophyta	Dinoflagellates
Division	Phaeophyta	Brown algae
Division	Rhodophyta	Red algae and slime molds
Division	Eumycophyta	True fungi
Class	Phycomycetes	Algal fungi
Class	Ascomycetes	Sac fungi
Class	Basidiomycetes	Club fungi
Class	Deuteromycetes	Imperfect fungi
Class	Lichens	Associations of an alga and a fungus
Division	Bryophyta	Mosses and liverworts
Class	Musci	Mosses
Class	Hepaticae	Liverworts
Division	Psilophyta	Whisk ferns
Division	Lycopodophyta	Club mosses
Division	Sphenophyta	Horsetails
Division	Pterophyta	Ferns
Division	Cycadophyta	Cycads
Division	Coniferophyta	Conifers
Division	Anthophyta	Flowering plants
Class	Dicotyledoneae	Two seed leaves; net veined leaves
Class	Monocotyledoneae	One seed leaf; parallel veined leaves

Plant Classification

Plants used for the purpose of horticulture are mostly found within the Division group of :

1. **Pterophyta**
2. **Cycadophyta**
3. **Coiniferophyta**
4. **Anthophyta**

Category	Scientific Name	Common Name
Division	Myxomycophyta	
Division	Schizophyta	Blue-green algae and bacteria
Class	Schizomycetes	Bacteria
Class	Cyanophyceae	Blue-green algae
Division	Chlorophyta	Green algae
Division	Euglenophyta	Euglenoids
Division	Chrysophyta	Golden-brown algae and diatoms
Division	Pyrrophyta	Dinoflagellates
Division	Phaeophyta	Brown algae
Division	Rhodophyta	Red algae and slime molds
Division	Eumycophyta	True fungi
Class	Phycomycetes	Algal fungi
Class	Ascomycetes	Sac fungi
Class	Basidiomycetes	Club fungi
Class	Deuteromycetes	Imperfect fungi
Class	Lichens	Associations of an alga and a fungus
Division	Bryophyta	Mosses and liverworts
Class	Musci	Mosses
Class	Hepaticae	Liverworts
Division	Psilophyta	Whisk ferns
Division	Lycopodophyta	Club mosses
Division	Sphenophyta	Horsetails
Division	Pterophyta	Ferns
Division	Cycadophyta	Cycads
Division	Coniferophyta	Conifers
Division	Anthophyta	Flowering plants
Class	Dicotyledoneae	Two seed leaves; net veined leaves
Class	Monocotyledoneae	One seed leaf; parallel veined leaves

Plant Classification

Coniferophyta (Gymnosperms)

It is a group of plants which are primarily **evergreen species** of the **temperate zone.**

There are about **700 species**.

Category	Scientific Name	Common Name
Division	Myxomycophyta	
Division	Schizophyta	Blue-green algae and bacteria
Class	Schizomycetes	Bacteria
Class	Cyanophyceae	Blue-green algae
Division	Chlorophyta	Green algae
Division	Euglenophyta	Euglenoids
Division	Chrysophyta	Golden-brown algae and diatoms
Division	Pyrrophyta	Dinoflagellates
Division	Phaeophyta	Brown algae
Division	Rhodophyta	Red algae and slime molds
Division	Eumycophyta	True fungi
Class	Phycomycetes	Algal fungi
Class	Ascomycetes	Sac fungi
Class	Basidiomycetes	Club fungi
Class	Deuteromycetes	Imperfect fungi
Class	Lichens	Associations of an alga and a fungus
Division	Bryophyta	Mosses and liverworts
Class	Musci	Mosses
Class	Hepaticae	Liverworts
Division	Psilophyta	Whisk ferns
Division	Lycopodophyta	Club mosses
Division	Sphenophyta	Horsetails
Division	Pterophyta	Ferns
Division	Cycadophyta	Cycads
Division	Coniferophyta	Conifers
Division	Anthophyta	Flowering plants
Class	Dicotyledoneae	Two seed leaves; net veined leaves
Class	Monocotyledoneae	One seed leaf; parallel veined leaves

Plant Classification

Anthophyta (Angiosperms)

- very **well distributed** all over the world (>250,000 species)
- Most of the **flowering plants** are grouped in this division
- They normally have **seeds that are fully enclosed in a fruit and has broad leaves.**

Category	Scientific Name	Common Name
Division	Myxomycophyta	
Division	Schizophyta	Blue-green algae and bacteria
Class	Schizomycetes	Bacteria
Class	Cyanophyceae	Blue-green algae
Division	Chlorophyta	Green algae
Division	Euglenophyta	Euglenoids
Division	Chrysophyta	Golden-brown algae and diatoms
Division	Pyrrophyta	Dinoflagellates
Division	Phaeophyta	Brown algae
Division	Rhodophyta	Red algae and slime molds
Division	Eumycophyta	True fungi
Class	Phycomycetes	Algal fungi
Class	Ascomycetes	Sac fungi
Class	Basidiomycetes	Club fungi
Class	Deuteromycetes	Imperfect fungi
Class	Lichens	Associations of an alga and a fungus
Division	Bryophyta	Mosses and liverworts
Class	Musci	Mosses
Class	Hepaticae	Liverworts
Division	Psilophyta	Whisk ferns
Division	Lycopodophyta	Club mosses
Division	Sphenophyta	Horsetails
Division	Pterophyta	Ferns
Division	Cycadophyta	Cycads
Division	Coniferophyta	Conifers
Division	Anthophyta	Flowering plants
Class	Dicotyledoneae	Two seed leaves; net veined leaves
Class	Monocotyledoneae	One seed leaf; parallel veined leaves

Plant Classification

Anthophyta Division are further subdivided into **2 major CLASSES** :

1. **Monocotyledoneae**
2. **Dicotyledoneae**

Category	Scientific Name	Common Name
Division	Myxomycophyta	
Division	Schizophyta	Blue-green algae and bacteria
Class	Schizomycetes	Bacteria
Class	Cyanophyceae	Blue-green algae
Division	Chlorophyta	Green algae
Division	Euglenophyta	Euglenoids
Division	Chrysophyta	Golden-brown algae and diatoms
Division	Pyrrophyta	Dinoflagellates
Division	Phaeophyta	Brown algae
Division	Rhodophyta	Red algae and slime molds
Division	Eumycophyta	True fungi
Class	Phycomycetes	Algal fungi
Class	Ascomycetes	Sac fungi
Class	Basidiomycetes	Club fungi
Class	Deuteromycetes	Imperfect fungi
Class	Lichens	Associations of an alga and a fungus
Division	Bryophyta	Mosses and liverworts
Class	Musci	Mosses
Class	Hepaticae	Liverworts
Division	Psilophyta	Whisk ferns
Division	Lycopodophyta	Club mosses
Division	Sphenophyta	Horsetails
Division	Pterophyta	Ferns
Division	Cycadophyta	Cycads
Division	Coniferophyta	Conifers
Division	Anthophyta	Flowering plants
Class	Dicotyledoneae	Two seed leaves; net veined leaves
Class	Monocotyledoneae	One seed leaf; parallel veined leaves

Plant Classification

Category	Scientific Name	Common Name
Division	Myxomycophyta	
Division	Schizophyta	Blue-green algae and bacteria
Class	Schizomycetes	Bacteria
Class	Cyanophyceae	Blue-green algae
Division	Chlorophyta	Green algae
Division	Euglenophyta	Euglenoids
Division	Chrysophyta	Golden-brown algae and diatoms
Division	Pyrrophyta	Dinoflagellates
Division	Phaeophyta	Brown algae
Division	Rhodophyta	Red algae and slime molds
Division	Eumycophyta	True fungi
Class	Phycomycetes	Algal fungi
Class	Ascomycetes	Sac fungi
Class	Basidiomycetes	Club fungi
Class	Deuteromycetes	Imperfect fungi
Class	Lichens	Associations of an alga and a fungus
Division	Bryophyta	Mosses and liverworts
Class	Musci	Mosses
Class	Hepaticae	Liverworts
Division	Psilophyta	Whisk ferns
Division	Lycopodophyta	Club mosses
Division	Sphenophyta	Horsetails
Division	Pterophyta	Ferns
Division	Cycadophyta	Cycads
Division	Coniferophyta	Conifers
Division	Anthophyta	Flowering plants
Class	Dicotyledoneae	Two seed leaves; net veined leaves
Class	Monocotyledoneae	One seed leaf; parallel veined leaves

Class: Dicotyledoneae

Most are **broadleaf** herbs, shrubs and trees **(200,000 species)**.

They have

i. **two seed leaves**
ii. **net veined** leaves.

Plant Classification

Category	Scientific Name	Common Name
Division	Myxomycophyta	
Division	Schizophyta	Blue-green algae and bacteria
Class	Schizomycetes	Bacteria
Class	Cyanophyceae	Blue-green algae
Division	Chlorophyta	Green algae
Division	Euglenophyta	Euglenoids
Division	Chrysophyta	Golden-brown algae and diatoms
Division	Pyrrophyta	Dinoflagellates
Division	Phaeophyta	Brown algae
Division	Rhodophyta	Red algae and slime molds
Division	Eumycophyta	True fungi
Class	Phycomycetes	Algal fungi
Class	Ascomycetes	Sac fungi
Class	Basidiomycetes	Club fungi
Class	Deuteromycetes	Imperfect fungi
Class	Lichens	Associations of an alga and a fungus
Division	Bryophyta	Mosses and liverworts
Class	Musci	Mosses
Class	Hepaticae	Liverworts
Division	Psilophyta	Whisk ferns
Division	Lycopodophyta	Club mosses
Division	Sphenophyta	Horsetails
Division	Pterophyta	Ferns
Division	Cycadophyta	Cycads
Division	Coniferophyta	Conifers
Division	Anthophyta	Flowering plants
Class	Dicotyledoneae	Two seed leaves; net veined leaves
Class	Monocotyledoneae	One seed leaf; parallel veined leaves

Class: Monocotyledoneae

Mostly lilies, palms and grasses **(50,000 species)**

They have:

i. one seed leaf;

ii. parallel veined leaves

Plant Classification

The reproductive parts such as the **flowers**, as well as other **non-reproductive** parts such as the **leaves** and **bud arrangements** are used as the basis for Plant Classification and identification

FAMILY

This category groups plants of similar or specific distinguishing characteristics that can be used for the purpose of identification.

Plant Classification

Members of the **same genus** will generally **cross-pollinate** among themselves but not with other genera.

Thus, **hybrids** are generally the **results of cro**sses of species within the same genus.

GENUS

It is a very important classification grouping whereby plants of similar genus are strikingly **similar morphologically**.

Plant Classification

The proper designation of a species always requires using the name of its genus as well as the specific epithet.

SPECIES

It is the **basic unit** of the taxonomic system. Individuals of a given species exhibit **greater similarities** morphologically than do the species of the genus.

Plant Classification

Variety is given to plants that **differ sufficiently in appearance within a species and** that are **similar** in most other ways.

The Sub-category of the Species are based on the **genetic differences** and other related ecological factors or sometimes to both is called as **VARIETY.**

Plant Classification

An example is the genetic differences that occurs naturally such as the **colour of the flowers**.

A special type of variety is the Horticultural variety or **CULTIVAR.**

This type of variety is selected and maintained only in cultivation.

Plant Classification

One of the most common groupings of horticultural plant are based on their **botanical characteristics,** are:

- **Tree**
- **Shrub (ornamental)**
- **Groundcovers/ Creepers**
- **Vines/ Climbers**
- **Palms**
- **Aquatic**
- **Herbaceous**
- **Succulent / Cacti**
- **Turf**

Plant Classification

Purpose to classify plants

Plant Classification

Purpose to classify plants

Plant Classification

EXERCISE 1:
Plant Identification

BASED ON THE 5 PLANTS THAT YOU HAVE LISTED IN THE FIRST TOPIC ASSIGNMENT, FIND THE PLANTS' GENUS AND FAMILY

FOR EXAMPLE:

PLANT'S NAME: Cocos nucifera

Genus : Cocos

Specie: Nucifera

Family: Palmae

THANK YOU