

**AL-Mustaqbal university college**  
**Pharmacy department**



# **Pharmacognacy I**

**Lec4**

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# **Chemistry of natural drugs products**

## **Natural products**

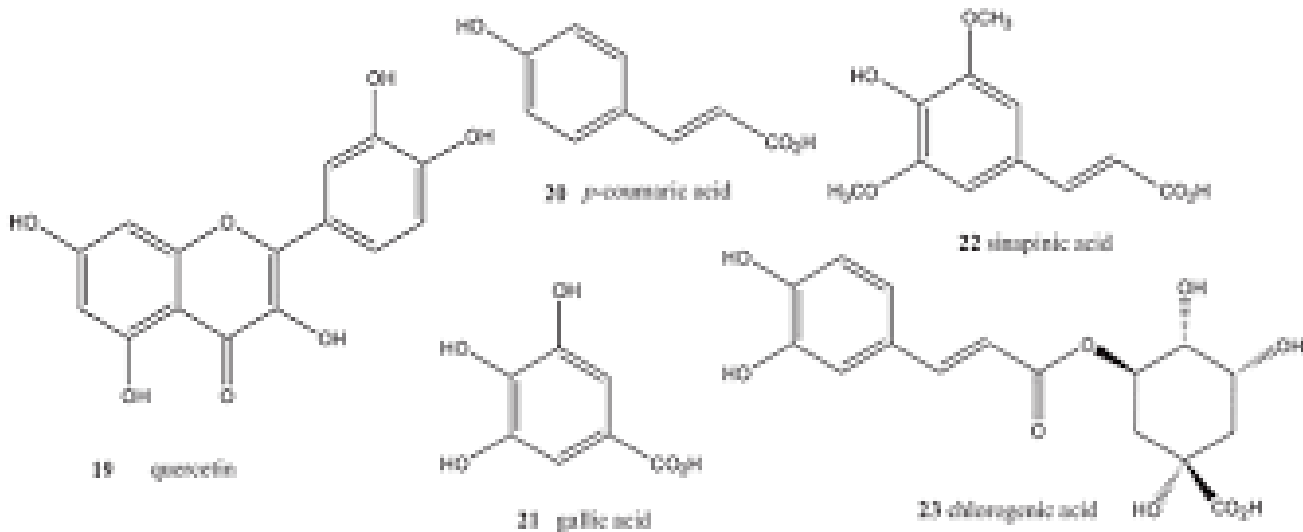
The compounds which are isolated from natural sources like plants, animals, fungi, bacteria and lichens are known as natural products.

These natural products are the end product of organism metabolism called metabolites, which perform different functions in animals and plant.

**Metabolites:** the intermediate end products of metabolism, these are usually small molecules.

- **Primary metabolites:** are essential for the plants growth and is involved in directly normal growth, development, and reproduction.
- **Secondary metabolites:** • A secondary metabolite is not directly involved in those processes and usually has a function but is not that important for the organism survival

**Active constituents** are responsible for the therapeutics activity of the drug; they may be single substances or mixtures e.g for single chemicals glycosides, terpenoids, steroids, phenylpropanoids, alkaloids & peptides. The mixtures chemical include gums, fixed oils, fats, waxes, volatile oil, resins & resin combinations.



**Drug biosynthesis or biogenesis** is the study of the biochemical pathways leading to the formation of secondary constituents used as drugs .Just as an understanding of the chemical synthesis of Phenobarbital or other synthetic drugs is of fundamental importance to the student of medicinal chemistry ,a knowledge of the biochemical synthesis of drugs of natural origin is of equal importance to the student of pharmacognosy .

The biosynthetic pathways leading to the formation of secondary constituents used as drugs ,amino acids and their simple derivatives served as precursors of structurally complex alkaloids

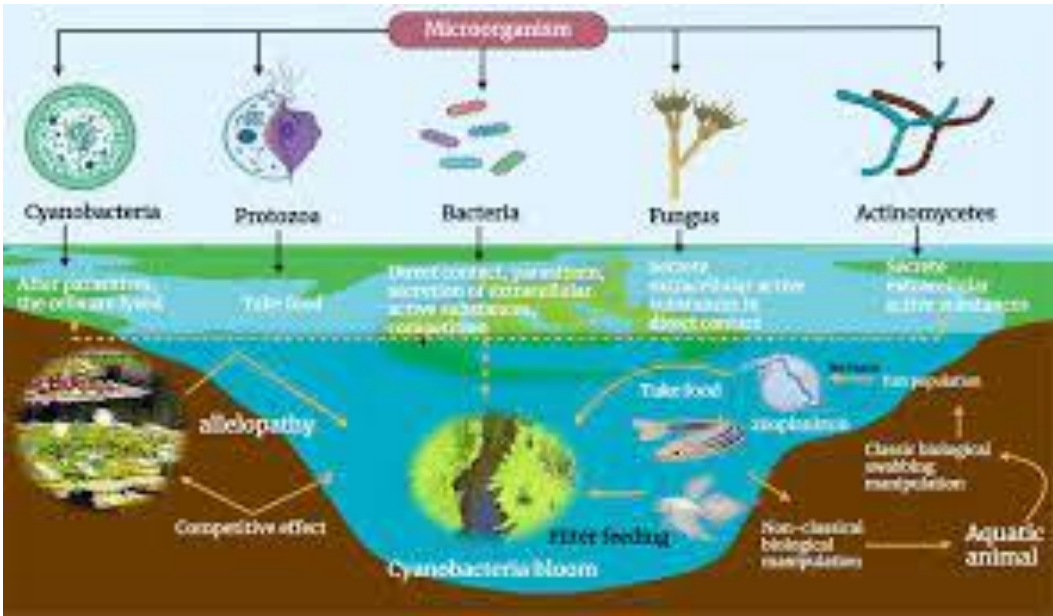
## Different sources of Natural products

- **Plants** is one the major source of natural products. the natural products isolated from the plants depends on
  - **Plant specie**: different species produce different metabolites.
  - **Variability** in growing conditions : Different growing condition also result different metabolites in the same species.
  - **Different part of the plants** mostly contained different metabolites.
- **Microbes** • Bacteria and microbes are the important source of natural products. The fermentation, followed by purification results some useful natural products. These natural products are very useful as antibiotic.

**Marine organism** are also important source of natural products.

However their collection is more challenging than plants.

- **The chemistry of marine natural products** will be influenced by different variables, for example, currents and sediments, pH levels, atmospheric constituents, metamorphic activity, and ecology .
- **Curacin A** is obtained from a marine cyanobacterium and shows potent antitumor activity.



- **Animal** also yield natural chemicals which are important.
- **Potent analgesic** compound called epibatidine has obtained from the poisonous skin extracts of the Ecuadorian frog.
- The snake venom and toxin also contained some useful peptides based natural products. These peptides based natural products have specific interaction with macro-molecules and cells. Like bungarotoxin from cobra snake

In animal drug keratin ,chitin ,muscle fiber &connective tissue are considered as inert .The presence of inert substances may be prevent or modify the absorbability or potency of the active constituents To eliminate the undesirable effects of inert matter in the crud drug or its preparations, by extracted, crystallized &purified for therapeutic use, these constituents referred to secondary plant substances





## **Major classes of organic natural products**

- Peptides and proteins (basically consist of amino acids)
- Fats and oils
- Nucleotides (purines)
- Vitamins
- Steroids
- Terpenes (terpenoids)
- Carotenoids (Carotenoids)
- Anthocyanines
- Alkaloids

Thank  
You!

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