

Pharmacognosy:

It is the study of drugs derived from plants or other natural sources. It also could be defined as "the study of the physical, chemical, and biological properties of drugs, drug substances of **natural origin** as well as the search for new drugs from **natural** sources".

The word "pharmacognosy" is derived from two Greek words: **pharmakon** (drug), and **gnosis** (knowledge). The term "pharmacognosy" was used to define the branch of medicine or sciences which deals with drugs in their crude خام, or unprepared, form.

Crude drugs : are the dried مجفف, unprepared material of plant, animal or mineral origin, used for medicine.

Although most pharmacognostic studies focus on plants, other types of organisms are also regarded as: bacteria, fungi and various marine organisms الكائنات البحرية.

The federal American Society of Pharmacognosy also defines pharmacognosy as "the study of **natural product molecules** that are useful for their medicinal, ecological بيئي or other functional properties, and also including ethnobotany النباتات الطبية, marine biology الاحياء البحرية, microbiology, herbal medicine

- **phytotherapy** العلاج بالنباتات : the medicinal use of plant extracts.
- **phytochemistry**, كيمياء العقاقير, the study of chemicals derived from plants (including the identification of new drug that derived from plant sources).
- **marine بحري pharmacognosy**, the study of chemicals derived from marine organisms.

phytochemicals are divided into:

(1) primary metabolites such as sugars and fats, which are found in **all plants**.

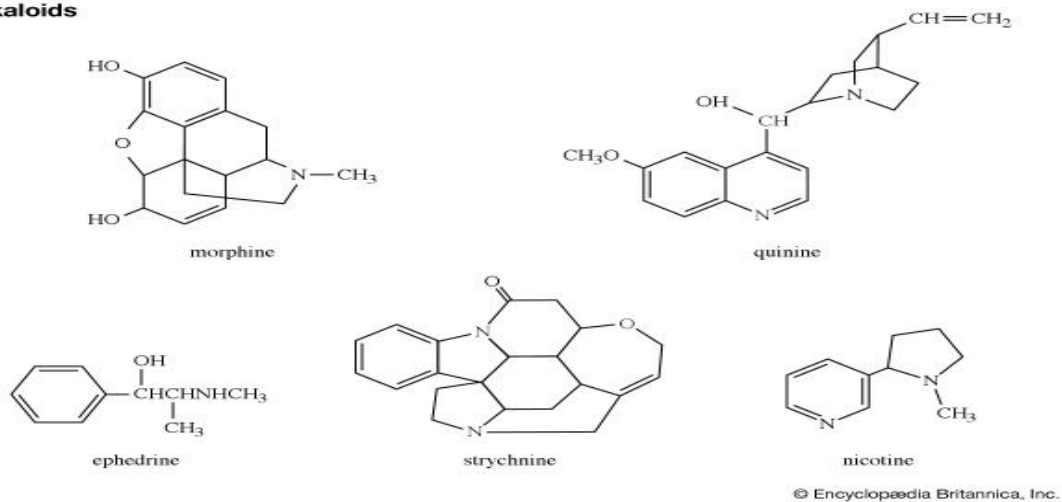
(2) secondary metabolites compounds which are found in a smaller range of plants, serving a more specific function. For example, some secondary metabolites are **toxins** used to deter predation تردع الافتراس and others are **pheromones** used to attract insects for pollination تلقح .

It is these secondary metabolites that had a therapeutic actions in humans and which can be refined to produce drugs—examples are **insulin** from the roots of dahlias, **quinine** قلوبيات (alkaloid used as antimalarial drug) from the cinchona (شجرة الكينيا), morphine and codeine from the poppy خشخاش, and digoxin from the foxglove. زهرة قفاز الثعلب.



- **Alkaloids** are a class of chemical compounds containing a basic nitrogen ring. Alkaloids are produced by bacteria, fungi, plants, and animals, and are part of the group of natural products.

Alkaloids



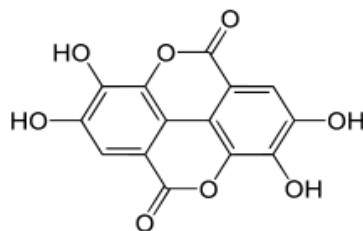
Many alkaloids have pharmacological effects and are used as medications. Examples are the

1-local anesthetic and stimulant; the psychedelic مخدر drugs (cocaine);2-the stimulant nicotine; 3-the analgesic morphine;



4-the antibacterial berberine; 5-the anticancer vincristine;6-the anti-hypertension agent reserpine;7-the anti-spasmodic agent atropine; 8-the vasodilator vincamine; 9-the anti-arrhythmia compound quinidine;10-the anti-asthma therapeutic ephedrine; and the antimalarial drug quinine.

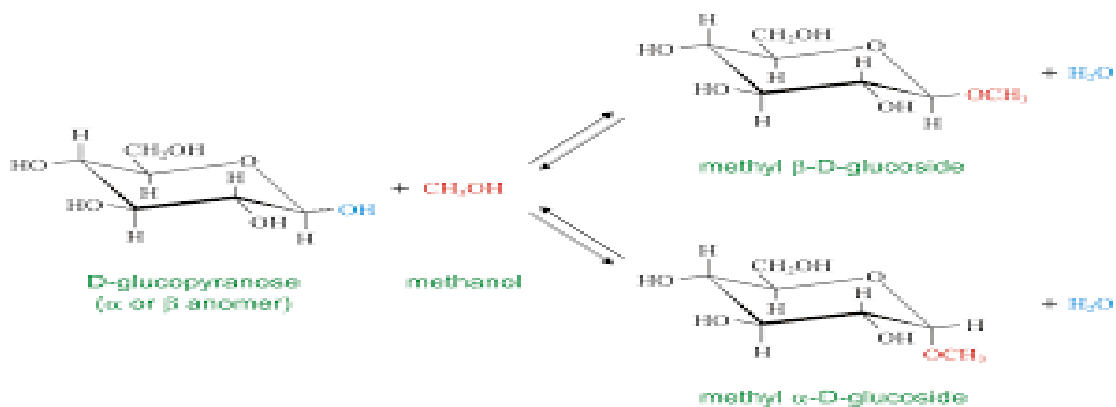
- **Polyphenols** (also known as **phenolic**) are compounds that contain phenol rings. Example is the antho-cyanins that give grapes العنب their purple color , the phytoestrogens from soya الصويا and the tannins العفص that give tea its astringency قبض الاوعية .



Glycosides

are molecules in which a sugar (glucose or fructose or others) is bound to a small organic molecule. Glycosides play numerous important roles in living organisms. Many plants store chemicals in the form of inactive glycosides.

These can be activated by enzyme hydrolysis, which causes the sugar part to be broken off, making the chemical available for use. Many such plant glycosides are used as medications. An example is the cyanoglycosides in cherry pits حبيبات الكرز that release toxins only when bitten by a herbivore متناولي الاعشاب



العطريات Terpenes

are a large class of organic compounds, produced by a variety of plants (conifers الصنوبريات), which has a strong smelling and thus may have had a protective function.

Terpenes are the primary constituents of the essential **flavor oils** دهون عطرية of many types of plants and flowers. Essential oils are used widely in perfumery صناعات العطور, and in medicines such as aromatherapy العلاجات الطبية بالعطور.

terpenes are also used in used in food additives as flavors(معطرة) and gives the red color of the carotenoids produce, yellows and oranges of pumpkin اليقطين , corn حبوب الذرة .

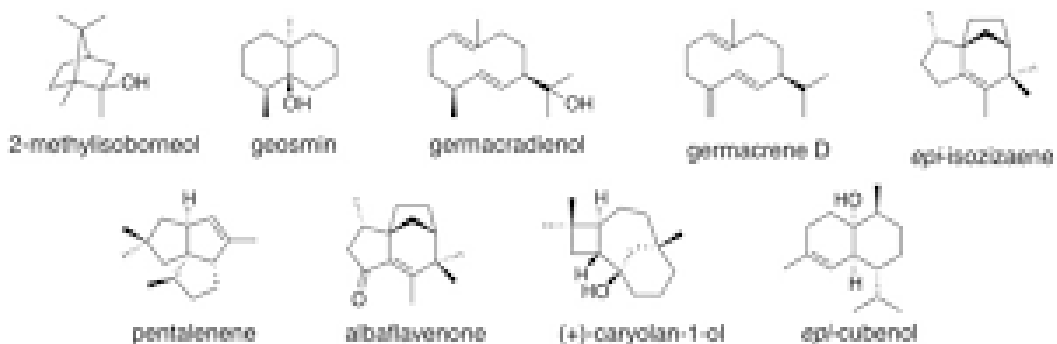


Fig. 1. The structures of the major known terpenes produced by bacteria.

Questions:

1-define pharmacogeny .2- "pharmacogeny" deals with drugs in their pure final form, true or false? 3- Crude drugs 4- The federal American society defines pharmacogeny as? 5-phytotherapy? 6-phytochemistry? 7-marine pharmacogeny?8-Alkaloids ?9- phenolic 10-glycosides 11-Terpenes 12-which is more appropriate for the recent disease treatment? Natural or synthetic drugs and why?