**Tannins Lec 3**

**They are complex chemical compounds, one of the secondary metabolism and be spread widely in plants where each plant must contain the tannins but the percentages vary from one plant to another, a deposition of proteins make it used in leather tanning and transformation of skins soft to strong solid skins.**

* **properties
1. Non -crystallized so difficult to obtain from the plant.
2. deposition of proteins and alkaloids.
3. use in case of poisoning by alkaloids .
4. widely used cancer-causing.
5. can be deposited by Heavy elements such as lead, iron.
6. dissolve in water, alcohol and acetone and Glycerol and insoluble in chloroform.**

**7- tannins are so bitter taste**

* **Classification of tannins**

 **1. Hydrolysable tanninsتانينات قابلة للتحلل**

**2. Condensed tannins تانينات غير قابلة للتحلل**

**3- Pseudo tannins**

**1. Hydrolysable tannins:**

**These tannins are hydrolyzed by acids, or enzyme and produce gallic acid and ellagic acid. Chemically, these are esters of phenolic acid like gallic acid and ellagic acid. The tannins derived from gallic acid are known as gallitannins and from that of ellagic acid are known as** [**ellagitannins**](https://en.wikipedia.org/wiki/Ellagitannin) **. The gallic acid is found in rhubarb راوند , clove القرنفل and ellagic acid is found in eucalyptus leave and pomegranate bark. These tannins treated with ferric chlorideكلوريد الحديديك to produced blue or black color.**

**2. Condensed tannins:**

**These tannins are resistant to hydrolysis and they derived from the flavonols, catechins and flavan-3, 4-diols.. These tannins are called as catechol tannins. These tannins are found in cinchona bark لحاء الكينا , male fernالسرخس الذكر , , tea leaves etc. they produce green color with ferric chlorides.**

**3. Pseudo tannins:**

**They are phenolic compounds of lower molecular weight and do not show the goldbeater’s test. They are found in catechu and nux - vomica, etc.**

* **Physiological functions in plant**
**1. have a role in the photosynthesis are found in parts of the developing fruits, leaves.**

**2- source of energy consumed by the plant in the process of metabolism.**

**3- working on the deposition of proteinsترسيب البروتينات to that found in the dead parts such as wood, this protective effect .**

**4- has the function of respiratory oxygen because it has attracted a property because they contain phenol for this increase in the plant's ability to get oxygen. لها وظيفة تنفسية لان لها خاصية جذب الاوكسجين لاحتوائها على الفينول لهذا تزداد قدرة النبات في الحصول على الاوكسجين**

**5- material phenolic disinfectant مطهرة protects the plant from harmful insects and fungi maintain the plant during its growth.**

**Uses**

1. **used against any diarrhea اسهال .
2. used in the treatment of burns.
3. The anti-poisoning alkaloids heavy metals.
4. anti- inflammatory.
5. used to stop the bleeding.
6. used in laboratories for detection purposes or deposition of protein and alkaloids.
7. used in leather tanning as tannic material is transforming the animal skin soft skins to non-perishable so as to precipitate the proteins found in the skinتستخدم في دباغة الجلود حيث ان المواد الدباغية تعمل على تحويل الجلد الحيواني الطري الى جلود غير قابلة للتلف وذلك لترسيب البروتينات الموجودة في الجلد**
* Plants which contain tannins
1. **( Hamamelis virginiana )** **Witch hazel**

**is a source of tannin used in a number of skin care products. Witch hazel has been used to treat bee stings, skin abrasions, and poison oak and ivy لعلاج لسعات النحل، سحجات الجلد، والبلوط السام واللبلاب . tannins are also used in mouth washes, eye washes .**

1. **(Vaccinium macrocarpon) cranberries توت بري**

**have been medically proven to help prevent urinary tract infections in women by reducing the ability of the bacteria E. coli from adhering to cells lining the urinary tract. Similarly, this anti-adhesive property may reduce the ability of H. pylori to cause stomach ulcers. Recent medical research has also shown**. **that these polyphenolic compounds can also reduce LDL cholesterol and improve cardiac health.**

**Resins**

 **In polymer chemistry and materials science, resin is a "solid or highly viscous substanceمواد لزجة جدا ," which are typically convertible into polymers. Such viscous substances can be plant-derived or synthetic in origin. They are often mixtures of organic compounds. Many plants, particularly woody plants produce resin in response to injury. The resin acts as a bandage protecting the plant from invading insects and pathogens.**

Plants secrete resins and rosins for their protective benefits they confound a wide range of herbivores, insects, and pathogens while the volatile [phenolic compounds](https://en.wikipedia.org/wiki/Natural_phenol) may attract benefactors such as [parasitoids](https://en.wikipedia.org/wiki/Parasitoids) or predators of the herbivores that attack the plant**.**

* PROPERTIES
1. **All resins are heavier than water , they are usually amorphous ,hard.**
2. **They are insoluble in water and usually insoluble in petroleum ether but dissolve more or less completely chloroform and ether. in alcohol**
3. **Many resins ,when boiled with alkaloids yield soaps.**
4. **Resins are often associated with volatile oils (oleoresins), with gums (gum-resins) or with oil and gum (oleo-gum-resins).**
5. **Resins may also be combined in a glycoside manner with sugars.**
6. **Chemically resins are not pure substances but complex mixtures of several resinous substances as resin acids, resin alcohols, resin esters, and neutral resins. ′ Resins ′( do not contain nitrogen elements Non nitrogenous compounds).**
* **CLASSIFICATION OF RESINS**

**Resins are classified in three different ways:**

1. **Taxonomical classification, i.e. according to botanical origin, e.g. Berberidaceae resins.**
2. **Classification according to predominating chemical constituent; e.g. acid resins, resene resins, glycosidal resins; etc.**  تصنيف وفقا لغلبة التركيب الكيميائي
3. **Resins may be classified according to the portion of the main constituents of the resin or resin combination; e.g. Gum resins, oleoresins, oleo-gum-resins, Glycol – resins , balsams.** وفقا لجزء من المكونات الرئيسية من الراتنج أو الراتنج مزيج

**Gum resins ex. Myrrh**

**Oleoresins ex. Turpentine**

**Oleo -gum -resins ex. Asafetida**

**Glycol – resins ex. Podophyllum**

 **Balsams : are resinous mixtures that contain large proportions of cinnamic acid, benzoic acid or both or esters of these acids**.

**balsam of Peru.**