



Simple phenolic, alcoholic and aldehyde glycosides

Phytotherapy

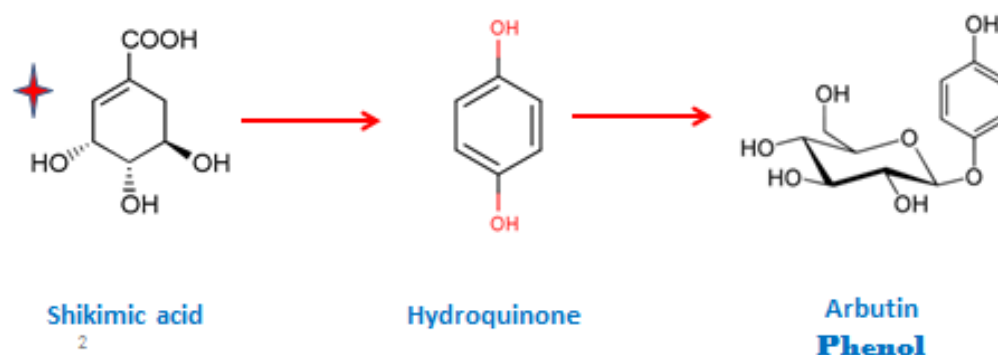
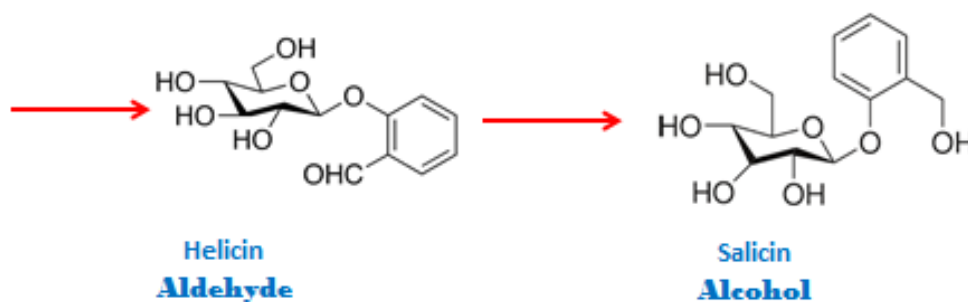
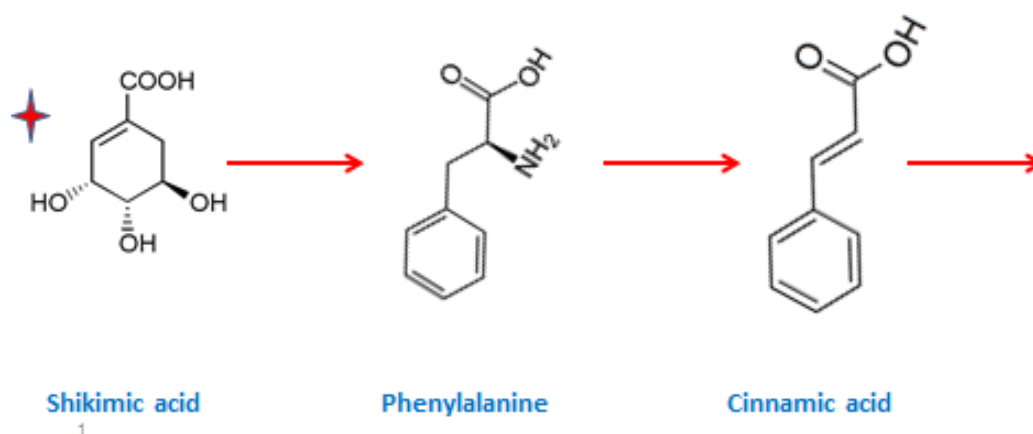


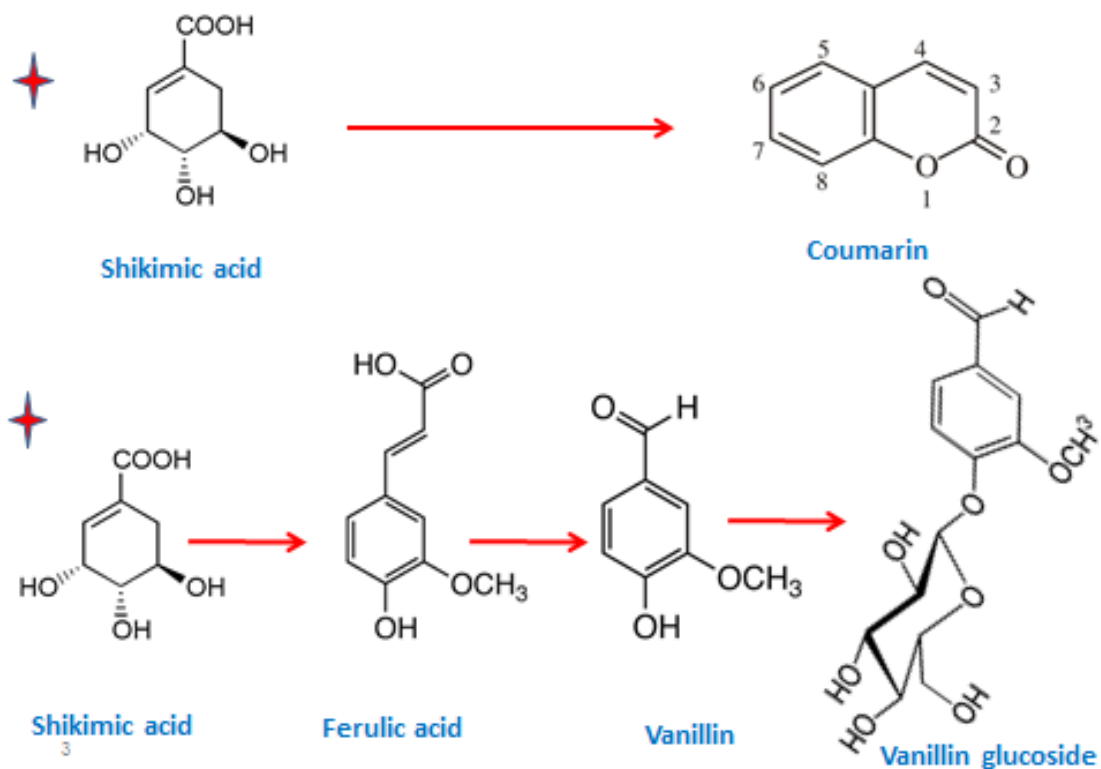
A brief description of some plants and their simple phenolic, alcohol and aldehyde glycoside constituents

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Simple phenolic glycosides

- These include phenol, aldehyde, coumarin and alcohol glycosides.
- All are derived from shikimic acid pathway.





- ❖ The compounds in this group have aglycones containing **phenolic** groups, but frequently have either alcoholic or carboxylic acid group substitutions.

ALCOHOL GLYCOSIDES:

1. Salicin:

- It is O-hydroxy benzoylglucoside.
- It is found in different species of **Willow bark** **صفصاف** like the following:

1. *Salix purpurea* } **Salicaceae**
2. *Salix fragilis* }
3. *Populus* species.

- Usually it is hydrolyzed by the enzyme emulsin to D-glucose and saligenin {**A mixture of enzymes, extracted from bitter almonds, once used to hydrolyze glucosides**}



S. purpurea
الصفصاف الأرجواني

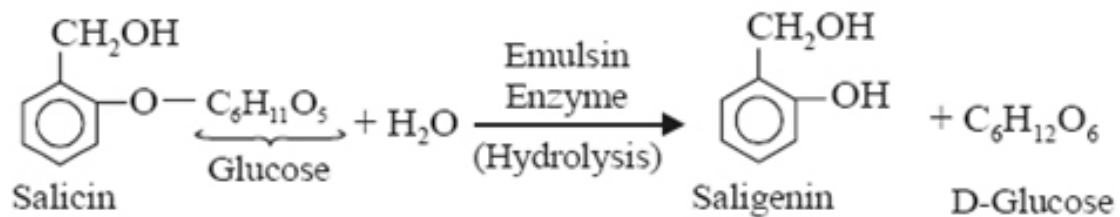
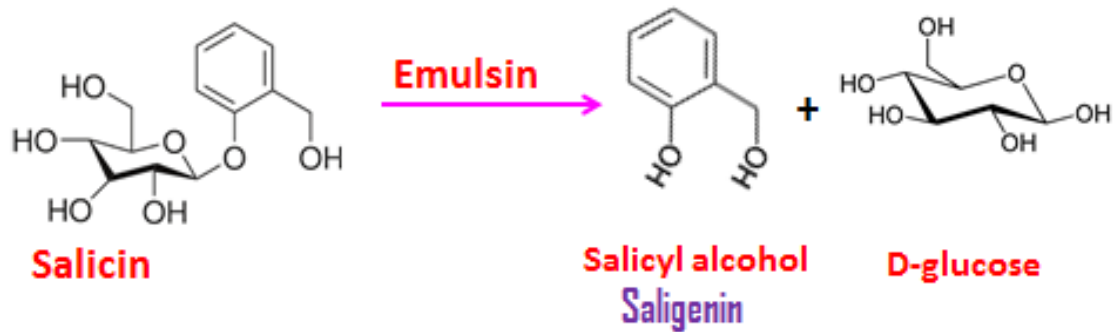
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S. fragilis
الصفصاف الهش



الْحَوْر هو جنس شجري
من الفصيلة الصفصافية.
خشبه لين تسهل معالجته،
يستعمل في صناعة الأثاث
واللوازم الخشبية

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2. Populin:

- It is benzoyl salicin and is a phenolic alcoholic glucoside.
- It is found in the **bark** and **leaves** of **Populus** species. (Family: **Salicaceae**).

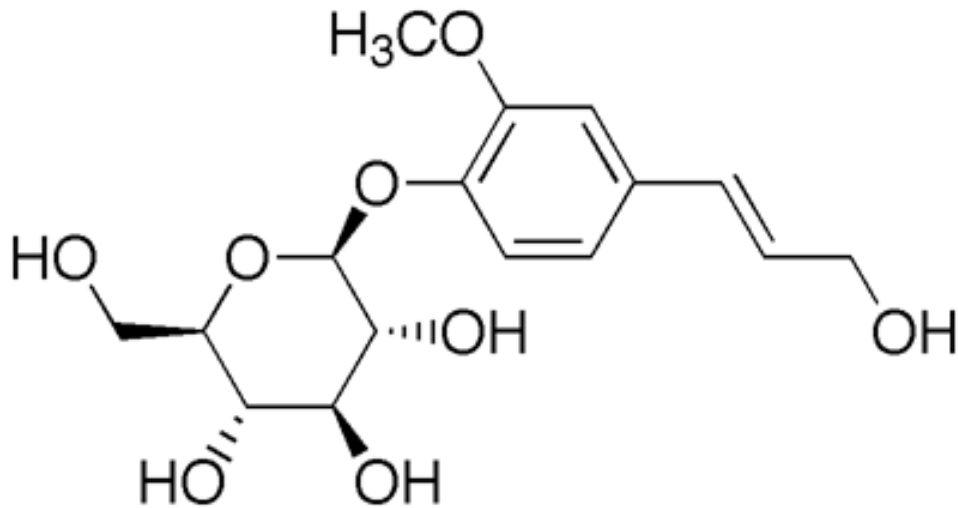
Hydrolysis:

1. **By alkali:** it gives benzoic acid and salicin (saligenin and glucose).
2. **By acid:** it gives benzoic acid, saligenin (salicyl alcohol) and glucose (i.e. here in acid hydrolysis, it is further hydrolyzed that salicin is hydrolyzed to its contents: saligenin and glucose).

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3. Coniferin:

- It is **m-methoxy-p-hydroxy cinnamyl alcohol glucoside**.
- This is found in most coniferous plants **النباتات الصنوبرية**
- **Is used for preparation of vanillin.**



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Aldehyde glycosides:

- The most important example of this group is:

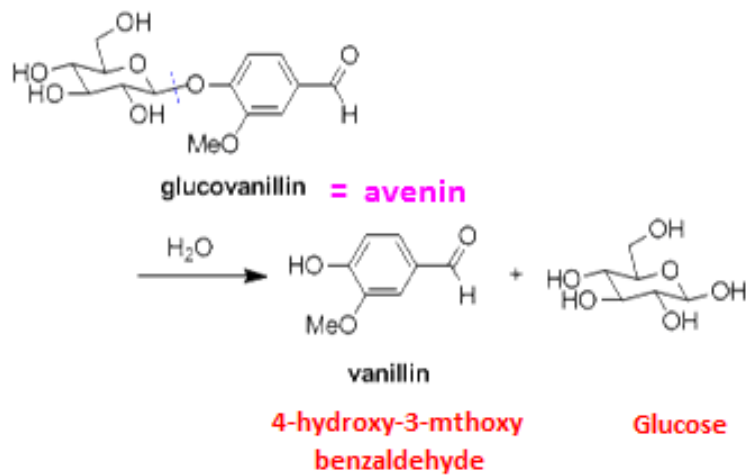
Vanilla:

- Is a drug that has an **aldehyde aglycone** as its chief constituent.
- **Vanillin** is the aglycone developed during the curing (processing) of vanilla beans.
- Vanillin is a methyl protocatechuic aldehyde.
- Vanilla bean is the cured, fully grown unripe:
 - a. Fruits of *Vanilla planifolia* Andrews, known in Commerce as **Mexican or Bourbon vanilla**.
 - b. *Vanilla tahitensis* J. W. Moore known in commerce as **Tahiti vanilla** (Fam. **Orchidaceae**).
- Vanilla contains two glycosides:
 1. **Glucovanillin (avenin)**: upon enzymatic hydrolysis, it gives **vanillin** and **glucose**.

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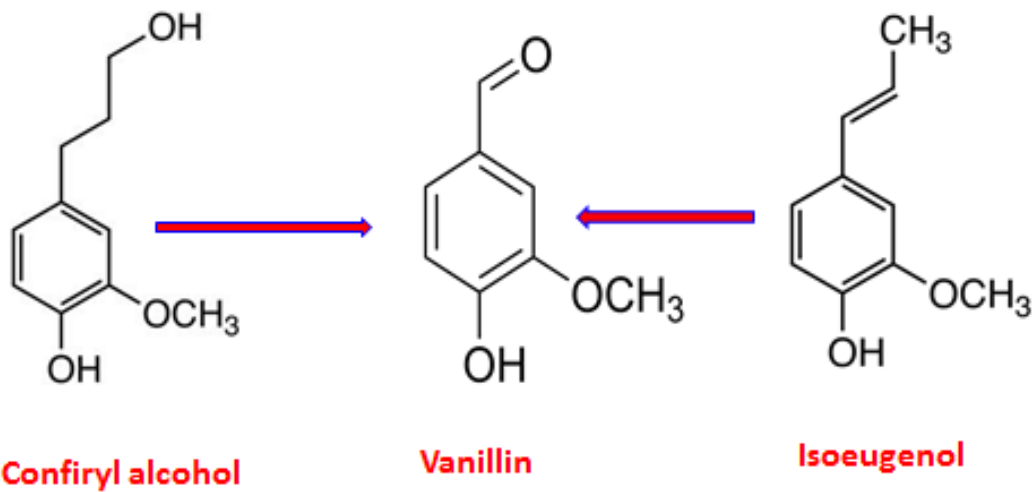
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➤ Vanillin is used as a **flavoring agent** specially in bakery.

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- At the same time, vanillin can be prepared synthetically from **isoeugenol** or **confiryl alcohol**, as follows:



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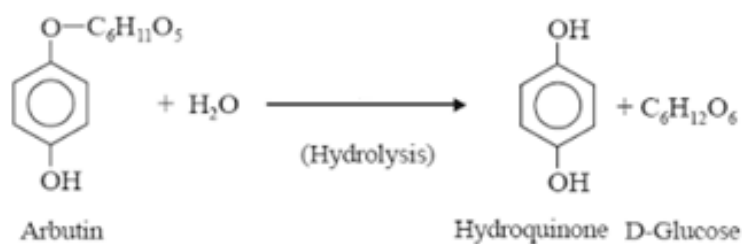
Phenol Glycosides:

- The aglycone groups of many of the naturally occurring glycosides are **phenolic** in characters like **arbutin** in Uva Ursi **عنب الدب**.
- Uva Ursi is the dried leaf of *Arctostaphylos uva-ursi* (F. **Ericaceae** **الخنجية**).



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- Its glycoside **arbutin** which is upon hydrolysis (e.g. human skin bacteria) yields **hydroquinone** and **glucose**.



➤ **USES:**

- Uva ursi has a long history of use for its diuretic and urinary antiseptic properties, also as astringent.
- But its use, these days, has been replaced by more effective diuretic agents.

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