Cascara Bark

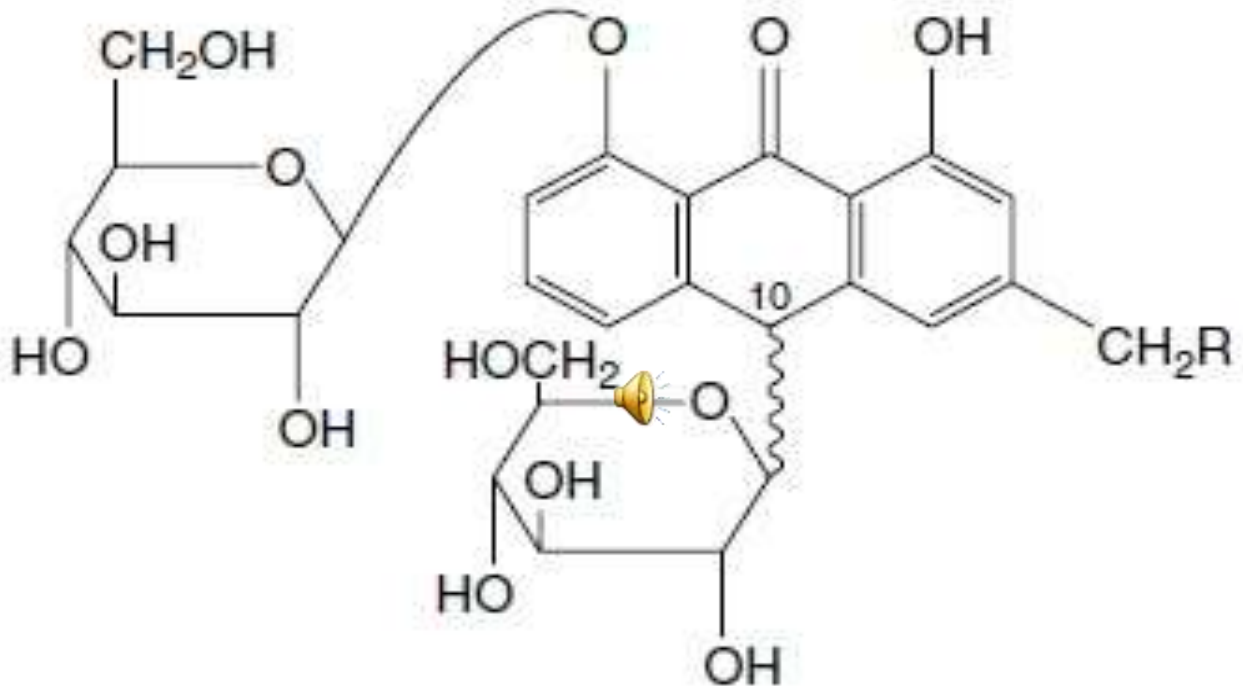
Official cascara sagrada is the dried bark of ***Rhamnus purshianus*** (F. ***Rhamnaceae***). The bark is collected from wild trees, which are 6–18 m high, growing on the Pacific coast of North America. It should be aged at least one year prior to use in medicinal preparations.

Reduced forms of emodin type glycosides are present in the fresh bark, during the minimum one year period, these glycosides are converted to monomeric oxidized glycosides which have a milder cathartic activity.

The very bitter taste of cascara is reduced by treating extracts with alkalis, alkaline earths or magnesium oxide.

Cascara contains about 6–9% **anthracene** derivatives which are present both as normal **O-glycosides** and as **C-glycosides**. The following groups of constituents are present:

1. Four primary glycosides or **cascarosides A**, **B**, **C** and **D**; they contain both O- and C-glycosidic linkages. These are the **C-10** isomers of the 8-O-β-d-glucopyranosides of **aloin** and **chrysophanol**.



Cascarosides of *Rhamnus purshianus*,
Configurations; Cascaroside A = 10β, R = OH; B = 10α, R = OH;
C = 10β, R = H; D = 10α, R = H.

2. Two **aloins**, **barbaloin** derived from the aloe-emodin anthrones and **chrysaloin** derived from chrysophanol anthrone. Also **10-hydroxyaloins A** and **B**.

3. A number of **O-glycosides** derived from emodin oxanthrone, aloe-emodin and chrysophanol.

4. Various **dianthrones**, including those of emodin, aloe-emodin and chrysophanol and the heterodianthrones palmidin A, B and C.

5. **Aloe-emodin**, **chrysophanol** and **emodin** in the free state.

The primary glycosides are more active than the aloins whereas the free anthraquinones and dimers have little purgative activity. The cascarosides have a sweet and more pleasant taste than the aloins.

Uses.

Cascara is a purgative resembling senna in its action. It is mainly used in the form of liquid extract or elixir or as tablets prepared from a dry extract.

Frangula Bark

Frangula bark is obtained from ***Rhamnus frangula*** (F. ***Rhamnaceae***), a shrub 3–5 m high and found in Britain and Europe.

The plant differs from the common **buckthorn** (***Rhamnus cathartica***) in that it does not possess thorns; it bears dark-purple berries whose medicinal properties have long been accepted. Although much used in England, the demand decreased with the increased popularity of cascara.
The composition and activity of frangula bark correspond to those of cascara sagrada.

Rhubarb

Rhubarb, rheum or Chinese rhubarb consists of the dried underground parts (roots and rhizomes) of ***Rheum palmatum*** or ***Rheum officinale*** (F. ***Polygonaceae***).

The drug is obtained from both wild and cultivated plants grown on the high plateaux of Asia from Tibet to south-east China. The drug is required to contain not less than 2.2% of hydroxyanthraquinone derivatives calculated as rhein.

The genus ***Rheum*** comprises about 50 species, which may be classified into two sections, the first including ***R. palmatum*** and ***R. officinale***, and the second ***R. rhaponticum***, ***R. undulatum*** and ***R. emodi***.

Indian rhbarb or **Himalayan rhubarb** consists of the dried underground parts (roots and rhizomes) of ***R. emodi*** and ***R. webbianum*** (F. ***Polygonaceae***).

Constituents.

The following types of anthraquinones are present in rhubarb:

1. Anthraquinones without a carboxyl group (e.g. chrysophanol, aloe-emodin, emodin and physcion) and their glycosides (e.g. chrysophanein and glucoaloe-emodin).
2. Anthraquinones with a carboxyl group (e.g. rhein and its glycoside, glucorhein).
3. Anthrones or dianthrones of chrysophanol, or emodin or aloe-emodin, or physcion. The dianthrone glucosides of rhein (sennosides A and B) and the oxalates of these (sennosides E and F).
4. Heterodianthrones derived from two different anthrone molecules. For example, **palmidin A** from aloe-emodin anthrone and emodin anthrone; **palmidin B** from aloe-emodin anthrone and chrysophanol anthrone; and **palmidin C** from emodin anthrone and chrysophanol anthrone. These dianthrones may be oxidized into their two components by means of ferric chloride.

Uses

Rhubarb is used as a bitter stomachic and in the treatment of diarrhoea, purgation being followed by an astringent effect. The drug is suitable as an occasional aperient but not for the treatment of chronic constipation. The cathartic action is relatively drastic and the use of other cathartic substances is adopted.

Aloes

Aloes is the solid residue obtained by evaporating the liquid which drains from the transversely cut leaves of various species of ***Aloe*** including ***Aloe vera*** , ***Aloe barbadensis***, ***Aloe africana***, ***Aloe spicata*** and ***Aloe ferox*** of the ***Liliaceae*** family.

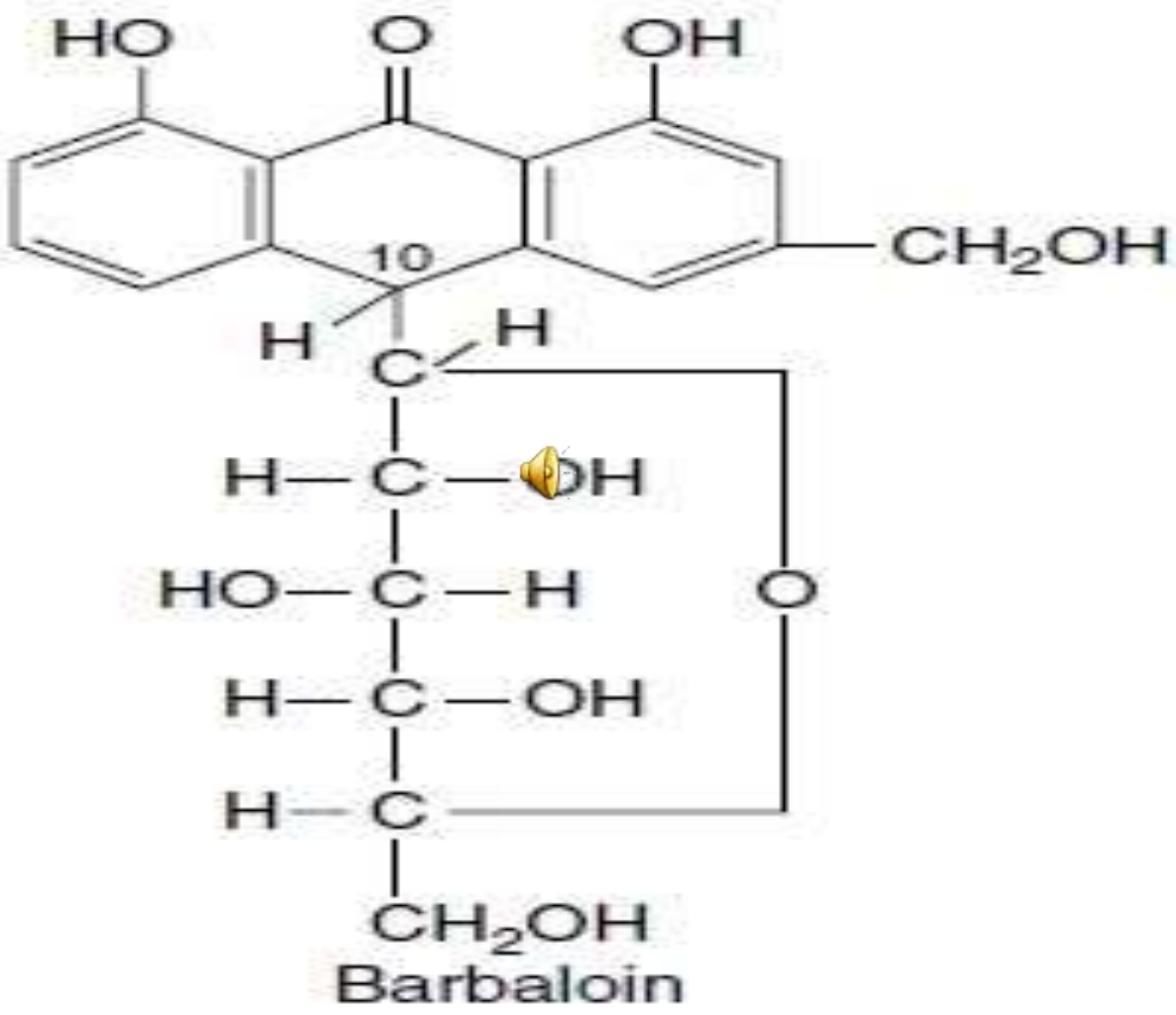
The juice is usually concentrated by boiling and solidifies on cooling.

The official varieties of aloes are the **Cape** from South Africa, and the **Barbados** (Curaçao) from the West Indian Islands of Curaçao.

Constituents

Aloes contain **C-glycosides** and **resins**. The crystalline glycosides known as‘**aloin**’which contains not less than 70% anhydrous **barbaloin**.
Barbaloin is a **C-glycoside**, unlike O-glycosides, it is not hydrolysed by heating with dilute acids or alkalis. It can, however, be decomposed by oxidative hydrolysis, with reagents such as ferric chloride.

Stereoisomerism is possible at C-10; **aloin A** is (10S)-barbaloin and **aloin B** the (10R)-epimer. The two are interconvertible via the corresponding anthranol form.
Small quantities of **aloe-emodin** are sometimes present in aloes, and Cape aloes also contains **aloinosides A** and **B**, which are O-glycosides of barbaloin; aloinoside B has rhamnose attached via an oxymethyl group at C-3.



Barbaloin

Uses

Aloes is employed as purgative. It is seldom prescribed alone, and its activity is increased when it is administered with small quantities of alkaline salts, while carminatives moderate its tendency to cause griping.

It is an ingredient of Compound Benzoin Tincture. The cathartic action is relatively drastic and the use of other cathartic substances is adopted.