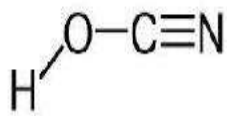
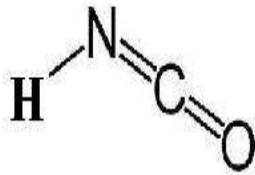


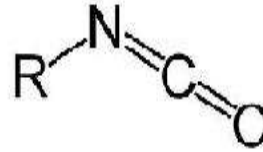
Isothiocyanate glycosides



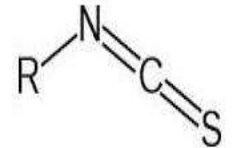
cyanic acid



iso cyanic acid

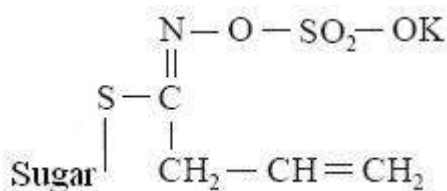


Isocyanate

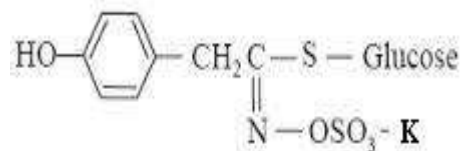


Iso thio cyanate

- 1- A number of plants of the family *Cruciferae* yield glycosides containing sulphur.
- 2- Hydrolysis of these, yield **volatile genins** of **thiocyanate** structure e.g., mustard oils.
- 3- The best known compounds **Sinigrin** and **Sinalbin**, two glycosides occurring in **black mustard** (*Brassica nigra*) and **white mustard** (*Brassica alba*) seeds respectively F: Crucifereae.

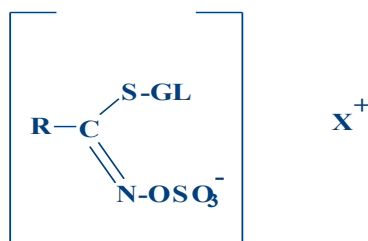


Sinigrin



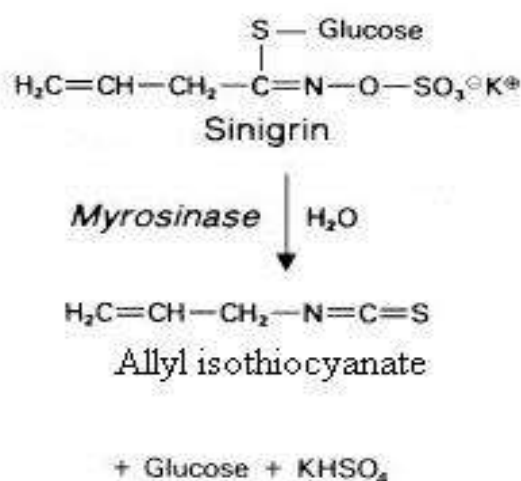
Sinalbin

- 4- The glycosides and their specific enzymes are found in **different cell** in the seeds. They **donot** interact until they are brought together by the **distruption** of the cell walls.
- 5- The general structure of thioglycosides is:



6- The **anion** is called the **glucosinolate ion**, **R** may be aliphatic or aromatic. The **cation (X)** may be a **simple metal ion** or a **complex organic cation**, e.g., **sinapine ion of sinalbin**.

7. **Sinigrin** gives upon hydrolysis, glucose, allyl isothiocyanate (volatile oil of mustard) and potassium acid sulphate.

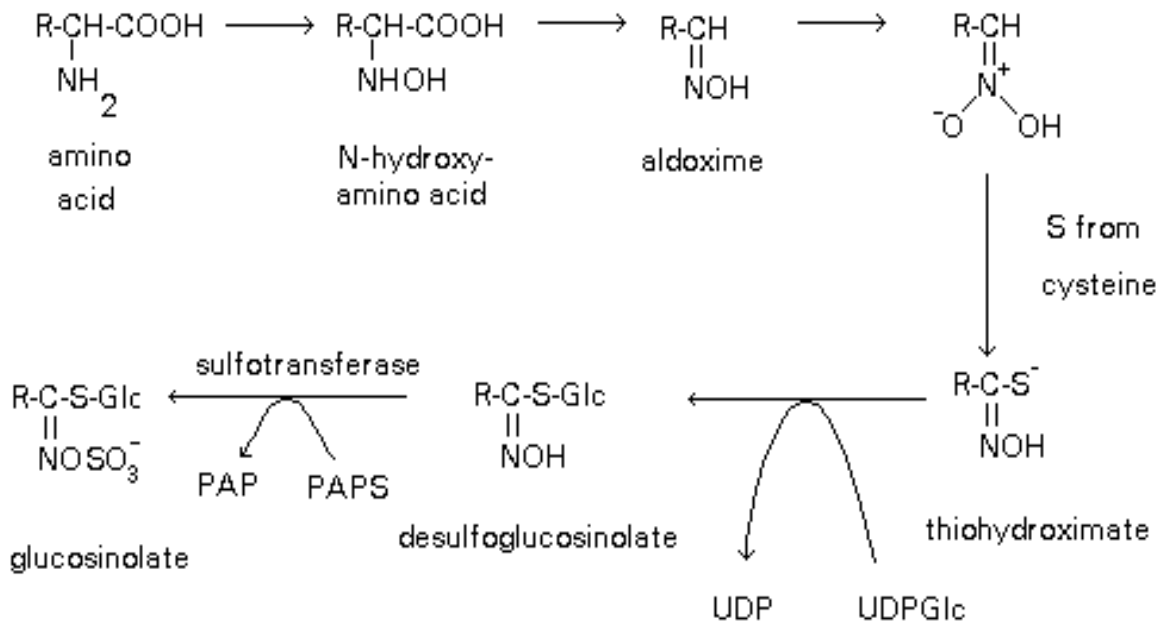


Hydrolysis of sinigrin

7. Hydrolysis of the glycoside **sinalbin** gives a phenolic isothiocyanate (Acrinyl isothiocyanate), glucose and the acid sulphate of a quaternary alkaloid, **sinapine**.

Biosynthesis of isothiocyanate glycosides:

Aglycones of isothiocyanate glycosides may consist of either aliphatic or aromatic derivatives. The aliphatic are derived from acetate while the aromatics from shikimic acid & that was proved by feeding labeled precursors. In general the following scheme could be applied for both (where **R**= aromatic or aliphatic side chain of amino acids)



Uses:

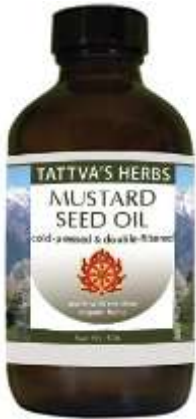
Black and white mustard seeds are used as rubefacients and counter irritants. These effects are attributed to their contents of thioglycosides. Commercially it is used as a condiment. A usual dose of 10mg is emetic.



Brassica nigra & its seeds



Brassica alba & its seeds



Mustard products