



# Medicinal seeds

CARDAMOM, AND BLACK MUSTARD SEEDS

# Cardamom seeds

## حب الهال (الحبهان)

- Origin:- Dried ripe or nearly ripe seeds of *Elettaria cardamomum*, recently separated from its fruit.

Family: Zingiberaceae



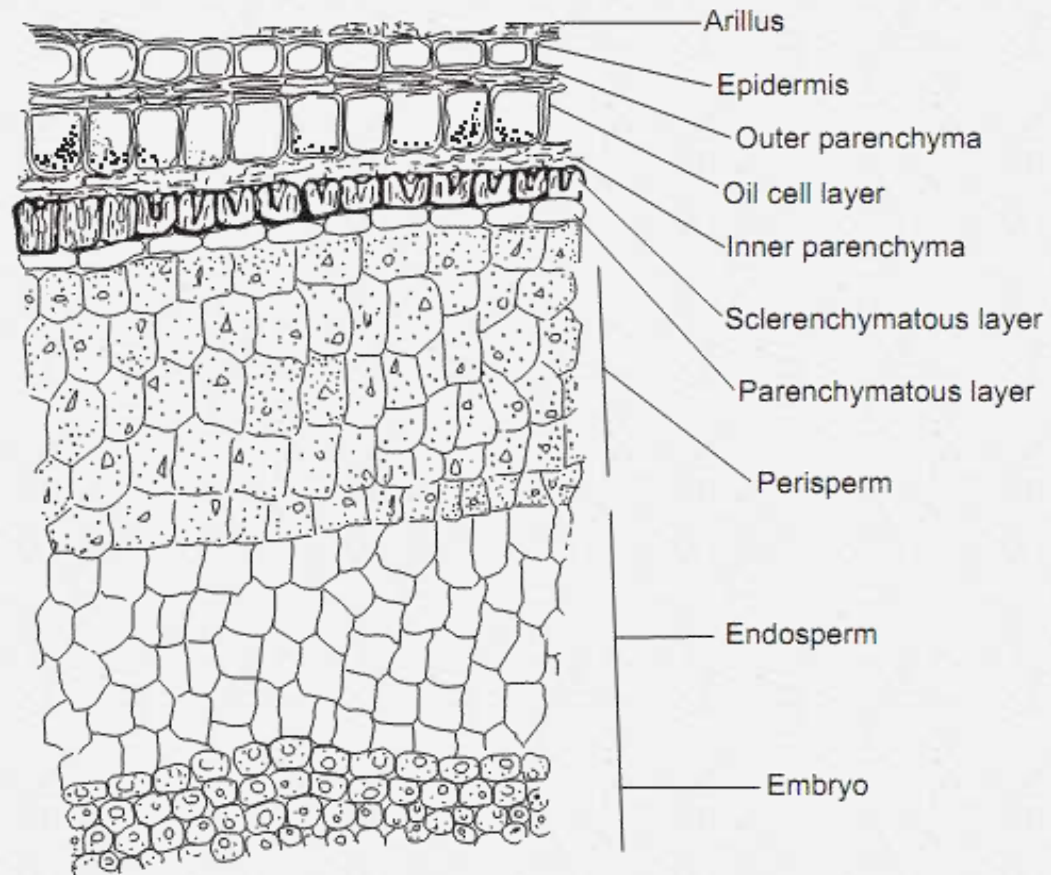
# Morphology

- Oblong or ovoid.  
It has a dark reddish-brown color, enveloped by a thin colorless membranous arillus.
- Anatropous ovule.
- Straight embryo.
- Albuminous seed.





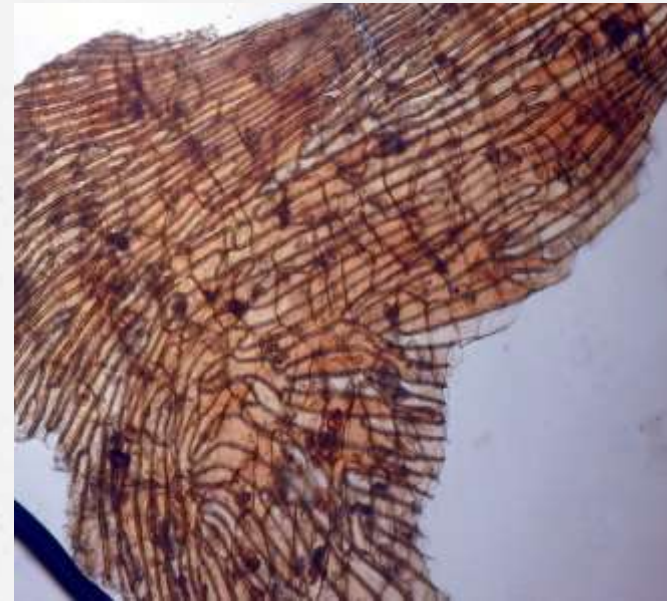
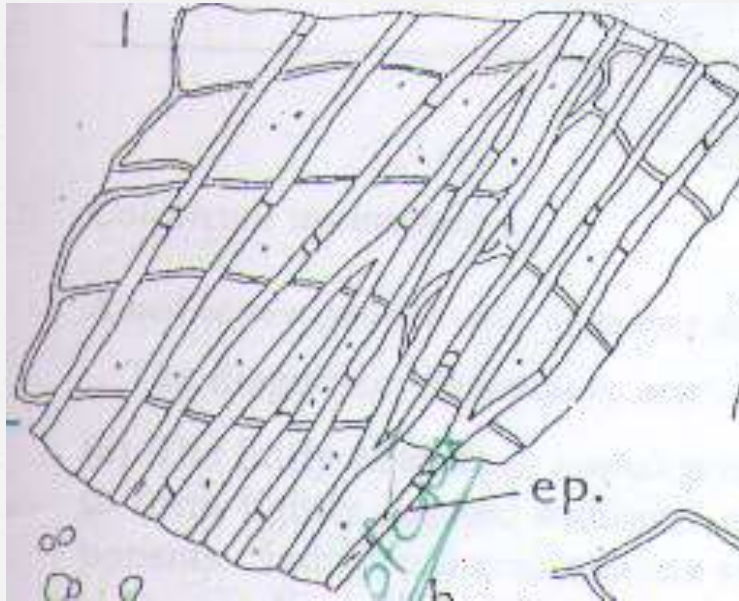
# T.S sector





# Microscopic character

- Epidermis: consist of fibers like cells called Prosenchyma (not lignified)



# Active constituents

- Volatile oil (2-8 %)  
[terpinyl acetate, terpineol, gingerol (intensely pungent taste) & cineol]
- Starch (perisperm).
- Protein, Fixed oil



# Uses

- ☐ Aromatic carminative, Antispasmodic.
- ☐ Flavoring agent & condiment.
- ☐ Hepatoprotective.

# Black mustard seeds

الخرذل الأسود

- Dried ripe seeds of *Brassica nigra*, family Cruciferae (Brassicaceae)





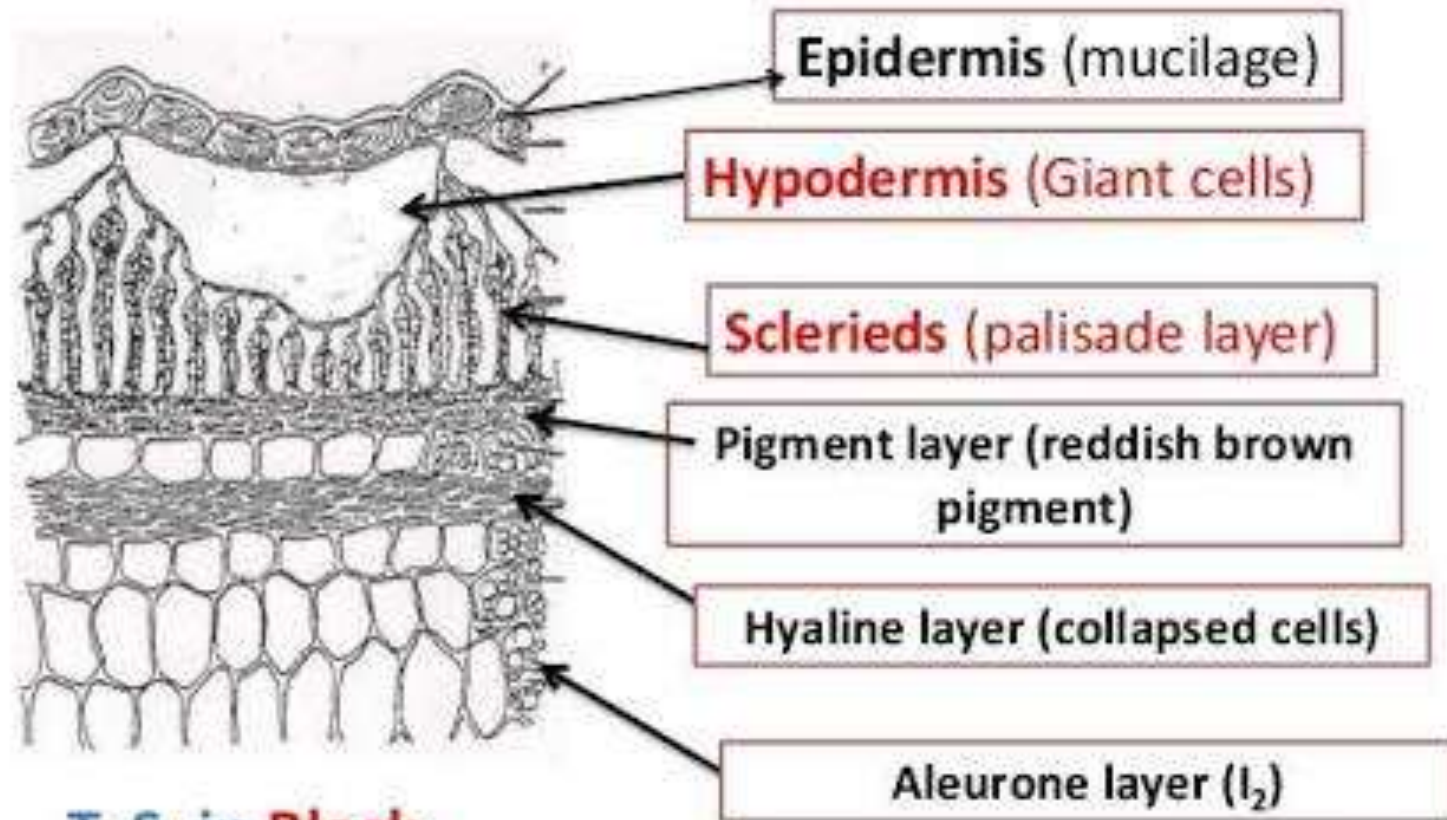
# Morphology

- ✓ Spherical or nearly spherical.
- ✓ It is hard but can be easily crushed under teeth.
- ✓ Orthoplocus embryo.
- ✓ Campylotropous ovule.
- ✓ Exalbuminous seed.
- ✓ Odor and taste: aromatic, pungent

T. cut in Black mustard showing  
✓ Orthoplocus embryo.





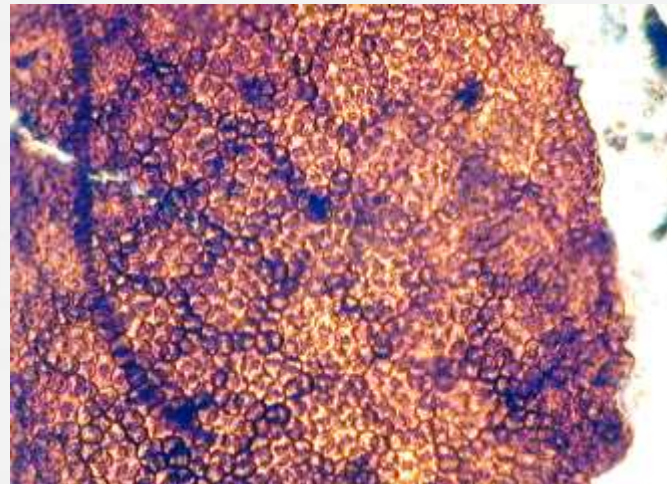
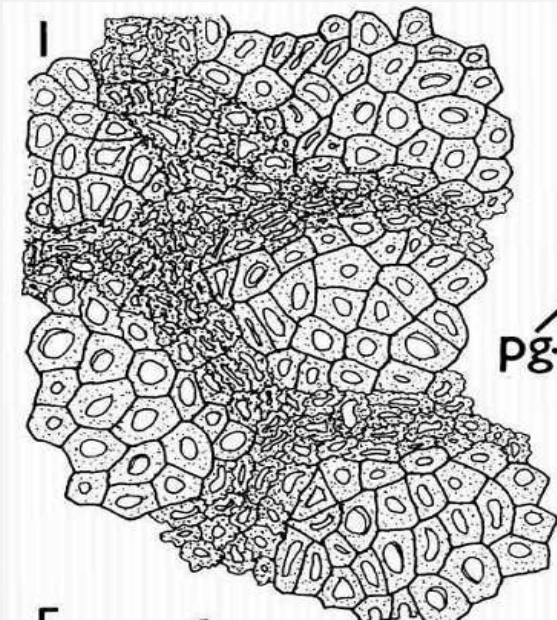


**T. S. in Black  
Mustard seed**



# Microscopic character

- The palisade layer (sclerides) of the testa in surface view composed of small, polygonal cells with thick, lignified walls. (Gaint cells)

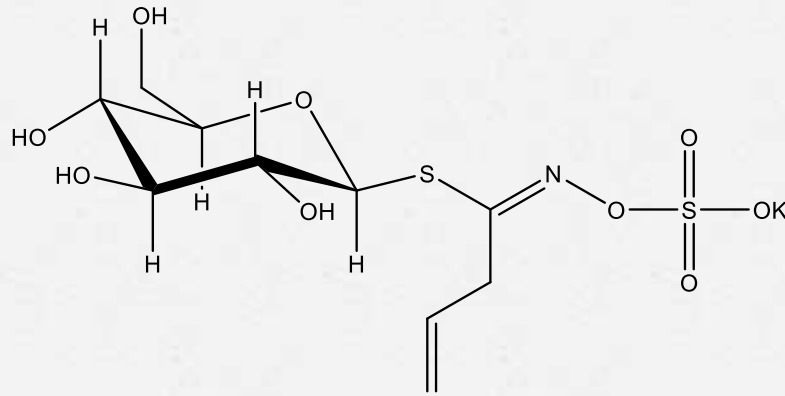


Giant hypodermis with  
Underlining sclerides

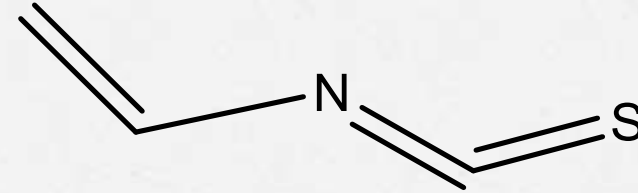


# Active constituents

- Thioglycoside (Sinigrin)
- Pectose mucilage
- Protein, Fixed oil



***Sinigrin***



**Allyl Isothiocyanate**

- ✓ Allyl isothiocyanate itself does not occur but when ground mustard seeds are mixed with water or chewed, a reaction between myrosinase and sinigrin gives allyl isothiocyanate & potassium hydrogen sulfate ( $\text{KHSO}_4$ ) & glucose.
- ✓ Allyl isothiocyanate serves the plant as a defense against herbivores since it is harmful to the plant itself, it is stored in the harmless form of the glucosinolate, separated from the myrosinase enzyme.



## Uses

- ✓ Counter-irritant, rubefacient
- ✓ Anti-rheumatic
- ✓ Internally used as condiment.



**Thank**

**You**