* Commercial source of Digoxin : D. lanata

* Furanocoumarin : Ammi majus
Psoralea.

* Lignan : Phyllanthus
Podophyllum

* monocyclic monoterpene : Limonene

Bicyclic monoterpene : α-pinene

* Photosensitizers : Ammi majus
Psoralea

* Hepatoprotective : Andrographis
Picrorrhiza

* Photoprotective : Aloe vera
Terminalia chebula
(Combretaceae)

* Resin from animal source : Shellac

* Pathological resin : myrrh
colophony

metabolic / physiological resin:
Turmeric, Ginger, Cannabis

Volatile oil classification

Acyclic monoterpene : citral, coriandrol
nerol, geraniol

monocyclic monoterpene :
menthol, menthone
carvone

Bicyclic monoterpene : Camphor
pine

Sesquiterpene : α, β-santalol
costuslactone

Phenylpropanoid

monomeric : p-coumaryl alcohol
coniferyl alcohol
sinapyl alcohol

Dimeric derivatives : Lignans

Polymeric derivates : Lignins.

* Marketed formulation :
  - Dill : Woodward's gripe water
  - Fennel : Abana (Himalaya)
  - Hajomala (Dabur)
  - Clove : Himsagar tail (Dabur)

* Body Rejuvenator : Punarnava

* Immunomodulator
  - Saponin → Bacopa
  - Terpenoidal → Tinospora

* Anticancer
  - Lignan : Podophyllum
  - Terpenoidal : Taxus.

* Nervine tonic
  - Shankhpushpi
  - Bacopa
  - Hydrocotyl.

Marker standardization

- Volatile Oil: Eugenol
- Glycoside: Digitoxin
- Resin: Curcumin
- Flavonoids: Quercetin
- Irridoids: Gentiopicroside

Important powder characteristics

1. Umbelliferous fruits (Dill, Fennel, Coriander)

Common: Endocarp, endosperm, yellow vittae, lignified mesocarp

Dill → lignified sclreids (stone cells) & nux vomica like red nuclei like endosperm

Fennel → fibers

Coriander → lignified sclerenchymatous layer (spread like bed sheet) & endocarp-mesocarp combined

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PHARMACOGNOSY & MEDICINAL PLANTS (II)

COMMON CHRATERS OF OF UMBELLIFEROUS FRUITS

1- They are usually cremocarps either entire or separated into its mericarps.
2- At the apex of fruit, there may be five small inconspicuous sepals, e.g., coriander, and in the centre are the two styles surrounded below by disc-like nectary forming the stylopod .
3- Each mericarp has 2 surfaces, a flat surface called the commissural surface and arounded one called the dorsal surface.
4- The dorsal surface shows 5 raised ridges over the vascular bundle called primary ridge between which may be found 4 ridges over the secretory canals and called secondary ridges; primary ridges are mostly more prominent except in coriander where the secondary ridges are more conspicuous.
5- There is a minute thread lies between the 2 mericarps usually attached basally to the pedicel and apically to the stylopod, it is called carpophore.
6- Each mericarp encloses a single seed derived from anatropous ovule. The seeds shows a large oily endosperm, small apical embryo and a raphe in the middle of the commissural side.
7- Mostly, the mericarp is longitudinally traversed by 5 vascular bundles in the primary ridges and by 6 schizogenous secretory ducts called vittae, 4 on the dorsal surface and 2 on the commissural one. The vittae may be simple as in fennel, branched as in anise or almost inconspicuous as in Hemlock.
8- The endocarp mother cells are divided into groups of narrow parallel cells which may be parallel to each other

forming parallel arrangement or variously oriented forming parquetry arrangement.

9- The endosperm cells contain aleurone grains enclosing a globoid and one or more micro- rosette crystals of calcium oxalate.

10- Umbelliferous fruits usually contain volatile oil secreted by the vittae but other constituents are reported in Ammi visnage which contain bitter principles and in Hemlock which contains alkaloids.