

⑧ **5.3.5. Ajowan**

Ajowan belongs to Umbelliferae family which has around 2,700 members including dill, caraway, and cumin. In dry form it contains not less than 1.0% w/w of thymol.

Synonyms

Trychyspermum copticum Link, *Carum copticum* Hieron, and Bishop's weed.

Biological Source

Ajowan are dried ripe fruits of *Trychyspermum ammi* Sprague.

Family

Umbelliferae

5.3.5.1. Occurrence and Distribution

Ajowan has its origin in Egypt. It is cultivated in Iraq, Iran, Afghanistan, and Pakistan. In India, it is grown in Madhya Pradesh, Uttar Pradesh, Gujarat, Rajasthan, Maharashtra, Bihar, and West Bengal.

5.3.5.2. Organoleptic Evaluation

Ajowan fruit has the following organoleptic characteristics (figure 5.11):

- 1) **Colour:** Yellowish-brown.
- 2) **Odour:** Agreeable.
- 3) **Taste:** Aromatic and warm like thymol.
- 4) **Size:** 1.7-3mm long, 1.5-2.4mm broad, and 0.5-1.5mm thick.
- 5) **Shape:** Occurs in the form of cremocarps or separated mericarps with bifid stylopod, and 5 light coloured ridges. Apical half to 2/3 parts of cremocarps has a touch of purple colour.

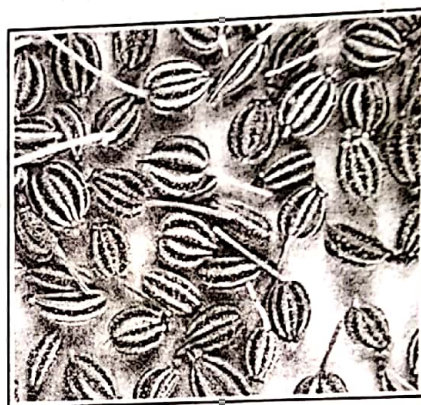


Figure 5.11: Ajowan Fruits

5.3.5.3. Chemical Constituents

Ajowan contains **volatile oil** (2-4%), **fat** (21%), **proteins** (17%), and **carbohydrates** (25%). Also, some traces of tannins, glycosides, and steroidal substances are present. Its volatile oil contains **thymol** (35-60%), **p-cymene** (50-55%), and **terpinene** (30-35%). Pinene, dipentenes, etc., are other volatile oil constituents. Thymol and volatile oil impart flavour and taste to ajowan.

5.3.5.4. Therapeutic Efficacy

Ajowan has the following therapeutic properties:

- 1) It is used as an antispasmodic, stimulant, and carminative.
- 2) It is also used in sore throat and bronchitis.
- 3) It is used in the preparation of lotions and ointments for checking chronic discharge.
- 4) Its oil and dethymolised oil is an antiseptic, antifungal, insecticide, and anthelmintic.

5.3.6. Cardamom

Cardamom is a spice made from the seeds of several plants belonging to the family Zingiberaceae.

Synonyms

Cardamom fruit, Elaichi, Hail, and Cardamom seeds.

Biological Source

Cardamom is the dried ripe fruits of *Elettaria cardamomum*.

Family

Zingiberaceae

5.3.6.1. Occurrence and Distribution

Cardamom grows wildy in Sri Lanka, Myanmar, Malaysia, and Malabar hills. In India it is grown in Karnataka, Tamil Nadu, and Kerala. Guatemala is the largest producer of cardamom in the world.

5.3.6.2. Organoleptic Evaluation

The organoleptic characters of different parts of cardamom are:

1) Cardamom Fruit (Capsule)

Colour: Pale green or cream.

Odour: Characteristic and aromatic.

Taste: Characteristic and aromatic.

Size: Length 1-2cm.

Shape: Ovoid or oblong.

Nature: It is a fruit developed from an inferior ovary (i.e., the inferior fruit); and inferior ovary is the one in which gynoecium is present below androecium.

Extra Features: The apex of capsule is curved and has the remains of calyx; while the base is round and has the remains of stalk. Capsules of different grades and varieties are of different sizes, shapes, and surfaces. The capsule contains three alveoli, containing three placentas having two rows of tightly joined seeds.

2) Cardamom Seed

Colour: a) Ripe seeds – Dark red-brown
b) Unripe seeds – Pale red

Odour: Strongly aromatic.

Taste: Pleasantly aromatic with a sensation of pungency.

Size: Length 4mm and width 3mm.

Shape: Angular.

Extra Features: Seed is covered with transversely wrinkled testa (a seed coat); and the testa is covered with a membranous aril. The seeds have groove at one end which marks the position of the raphe, and a depression at the other end.

3) Cardamom Oil

Colour: Pale yellow liquid.

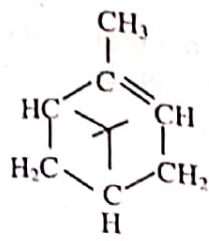
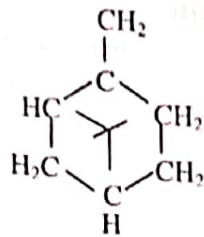
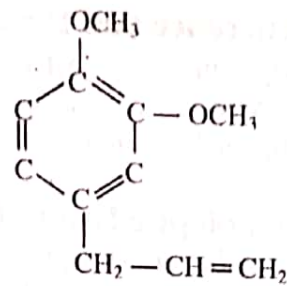
Odour: Balsamic.

Taste: Sweet and aromatic.

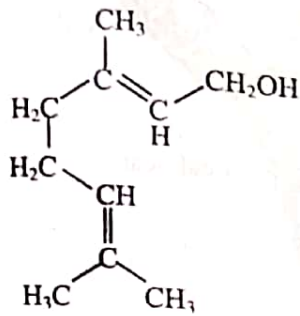
Viscosity: Watery.

5.3.6.3. Chemical Constituents

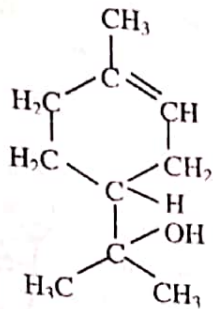
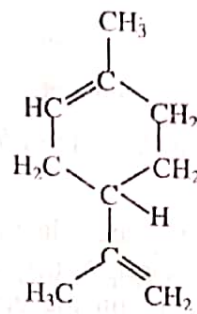
The chemical constituents of cardamom fruits are **volatile oil** (2.8-6.2%), **starch** (50%), **fixed oil** (1-10%), and **calcium oxalate**. The principal constituents of oil are α -pinene, β -pinene, limonene, α -terpineol, geraniol, methyl eugenol, myrcene, sabinene, α -phellandrene, p-cymene, terpinolene, linalool, linalyl acetate, α -terpineol acetate, citronellol, and *trans*-nerolidol.

 α -Pinene β -Pinene

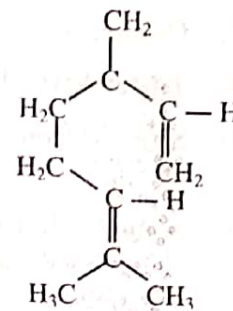
Methyl eugenol



Geraniol

 α -Terpineol

Limonene



Myrcene

5.3.6.4. Therapeutic Efficacy

Cardamom has the following therapeutic properties:

- 1) It is a stimulant and carminative.
- 2) It is used for treating indigestion, constipation, and flatulence.
- 3) In India, green cardamom (*A. subulatum*) is used for treating teeth and gum infections.
- 4) It is used for preventing and treating throat troubles, congestion of lungs, and pulmonary tuberculosis.
- 5) It is used in inflammation of eyelids.
- 6) It is used as an antidote for snake as well as scorpion venom.
- 7) It is regarded as a cure for obesity.
- 8) It is used as a breath-freshener.
- 9) It is used in nausea (even the nausea related to pregnancy) and heartburn.
- 10) Its oil is used as an antiseptic, antispasmodic, carminative, digestive, stomachic and tonic, diuretic, expectorant, and stimulant.

5.3.7. Ginger

The generic name of ginger is *Zingiber*, which has been derived from the Greek word *Zingiberis* which in turn has been derived from *Singabera* (Sanskrit name of ginger). It is in use since ancient times in India as well as in China, and by the 1st century traders had transported ginger to the Mediterranean region.

Synonyms

Zingiber and Zingiberis.

Biological Source

Ginger is the rhizomes of *Zingiber officinale* Roscoe, scrapped to remove the outer skin and dried in the sun. It is known as **Jamaica ginger** in the market.

Family

Zingiberaceae

5.3.7.1. Occurrence and Distribution

Ginger has its origin in South East Asia; although it is cultivated in Caribbean islands, Africa, Australia, Mauritius, Jamaica, Taiwan, and India. More than 35% of the world's production of ginger is from India.

5.3.7.2. Organoleptic Evaluation

Ginger has the following organoleptic characteristics (figure 5.12):

- 1) **Colour:** External surface is buff coloured.
- 2) **Odour:** Agreeable and aromatic.
- 3) **Taste:** Agreeable and pungent.
- 4) **Size:** Rhizomes are 5 to 15×1.5 to 6.5cm.
- 5) **Shape:** Rhizomes are laterally compressed, have short, flat, ovate, and oblique branches on the upper side, and a bud at the apex.
- 6) **Fracture:** Short and fibrous.
- 7) **Extra Features:** Surface has longitudinal striations and occasional projecting fibres. Transversely cut surface has well-marked endodermis and stele.

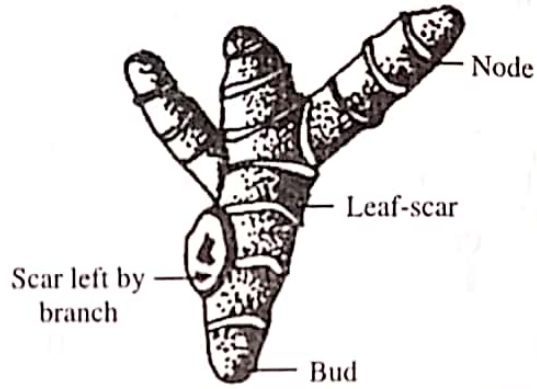


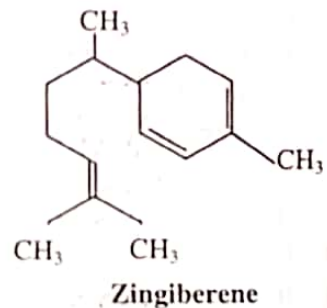
Figure 5.12: Ginger Rhizome with Buds

5.3.7.3. Chemical Constituents

Ginger contains volatile oil (1-4%), starch (40-60%), fat (10%), fibre (5%), inorganic material (6%), residual moisture (10%), and acrid resinous matter (5-8%). Ginger oil is made up of monoterpene hydrocarbons, sesquiterpene hydrocarbons, oxygenated mono and sesquiterpenes, and phenyl propanoids.

The content of sesquiterpene hydrocarbons in all types of ginger oil is the same and includes α -zingiberene, β -bisabolene, α -farnesene, β -sesquiphellandrene, and α -curcumene.

Ginger obtains its aroma from the fragrant principles of volatile oil, and its flavour, pungency and pharmacological action from the phenolic ketones of oleo-resin (gingerols like shogaols, zingerone, paradols, gingediols hexahydrocurcumin, and *o*-methyl ethers of these compounds). Some components of volatile oil (isometric terpenic aldehydes like geranial and citral) give the delicate and lemony aroma to ginger. Some of the sesquiterpene oil hydrocarbons impart a spicy touch to ginger.



5.3.7.4. Therapeutic Efficacy

Ginger has the following therapeutic properties:

- 1) It is used as a stomachic, aromatic, carminative, stimulant, and flavouring agent.
- 2) Its powder is effective in motion sickness.
- 3) Due to its adsorbent, aromatic, and carminative properties on GIT, it enables adsorption of toxins and acid enhanced gastric motility; thus blocking the effects of GI reactions and nausea.
- 4) *Z. officinale* (a methanolic extract) has molluscicidal effects, and can also control parasitic infections. USFDA have included ginger product as safe (GRAS).