



**Identification of  
Tiny Seed and Fruit  
Types of Chinese  
Materia Medica**



# Fructus Carotae\*

## Source

The dried ripe fruit of *Daucus carota* L. in the family Umbelliferae

## Property and flavour

Neutral; bitter and pungent; slightly toxic

## Meridian affinity

Spleen and stomach meridians

## Actions

To kill parasitic worms and alleviate malnutrition

Note:

\* Its name in Chinese Pharmacopoeia (2020 Edition) is “Carotae Fructus”.

## Micro-morphological features

### Shape

**Mericaip appears flattened elliptical or flattened oblong**



1 mm



**Top view**

Dorsal side is protruding, with 4 narrow wings

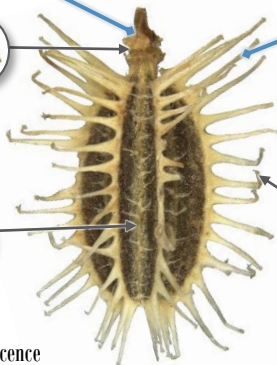
With gourd-shaped or semicylindrical stylopodium at the apex



Some can be observed with a persistent style



1 ridge with short pubescence slightly protruding between wings



**Dorsal view**

With 1 column of flat spines on each wing

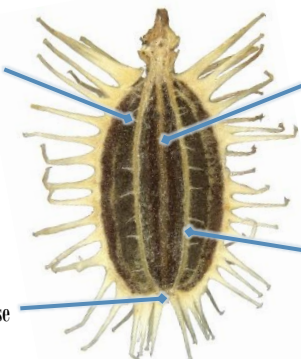
Some spines can be observed with 1 to several spinules at the apex



1 mm

Commissure is flat

Base is obtuse



With 1 vein in the middle

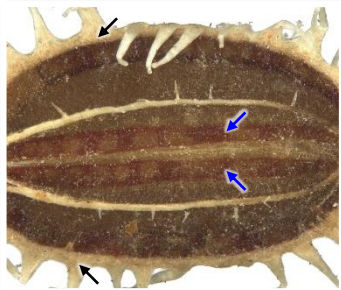
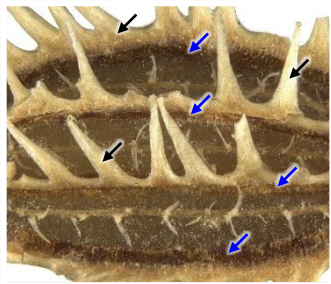
With 1 slightly protruding ridge on both sides of the vein and short pubescence on the ridge

Commissural view

1 mm

**Surface**

Yellowish-brown or brown, some can be observed with reddish-brown or brown vittae (→) on both sides of the wings and the vein; spine (→) is yellowish-white, with smooth surface



0.5 mm

**Odour**

With characteristic aroma when broken by rubbing

## Powder microscopic features

### Trichome

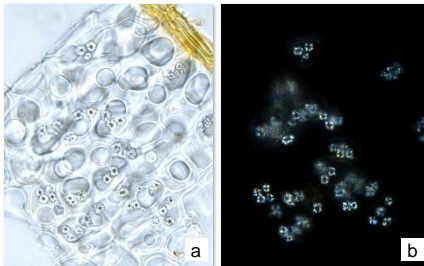
#### Non-glandular hair



Frequently found, unicellular, with thin or slightly thick wall, with fine and dense warty protuberances on the surface, base is usually surrounded by several cells

### Crystal

#### Cluster of calcium oxalate



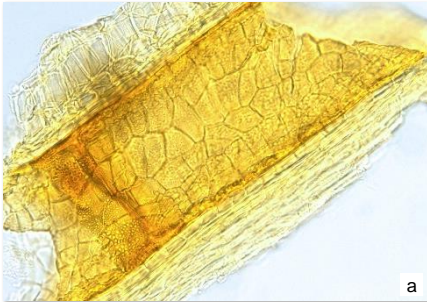
Numerous, fine, usually present in endosperm cell; orange-yellow or polychromatic under polarized light microscope

*a. features under bright field; b. features under polarized light*

50  $\mu$ m

## Secretory tissue

### Vitta



Frequently found, yellowish-brown or reddish-brown, secretory cell appears polygonal in surface view, with septum sometimes observable

## Pericarp

### Exocarp cell



Yellowish-brown, appears polygonal in surface view

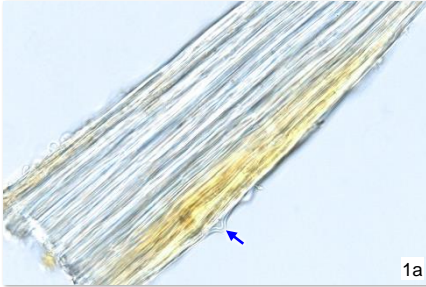
**Endocarp cell**

Yellowish-brown, appears long strip-shaped or sub-polygonal in surface view

**Testa****Testa cell**

Yellowish-brown, appears sub-polygonal or sub-rectangular in surface view, with linear striations on the surface

## Others

Fragment of spine

Frequently found, colourless, consists of multiple columns of narrow and long sclerenchymatous cells, with tubercular protuberances (→) occasionally found on the surface (1), some with non-glandular hair (2) at the apex



## Key identification features

### Micro-morphology

- ⊙ Mericarp appears flattened elliptical or flattened oblong, with stylopodium at the apex
- ⊙ With 4 narrow wings at the dorsal side and 1 column of flat spines on each wing

### Powder microscopy

- ⊙ Non-glandular hair: unicellular, base is usually surrounded by several cells
- ⊙ Vitta: frequently found, secretory cell appears polygonal in surface view
- ⊙ Fragment of spine: frequently found, consists of multiple columns of narrow and long sclerenchymatous cells

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