

Pharmacognosy

PHG 112
PG 102

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Fall 2024

The background features a dark blue gradient with a large, stylized green shape on the left side that resembles a thick, curved arrow or a leaf. On the right side, there is a thin, golden-brown outline of a branch with several leaves.

Faculty of **Pharmacy**

Lecture 6



By the end of the lecture, students should be able to demonstrate knowledge of:

- **Nutraceutical and cosmeceutical fruits**

- Papaya**

- Lychee**

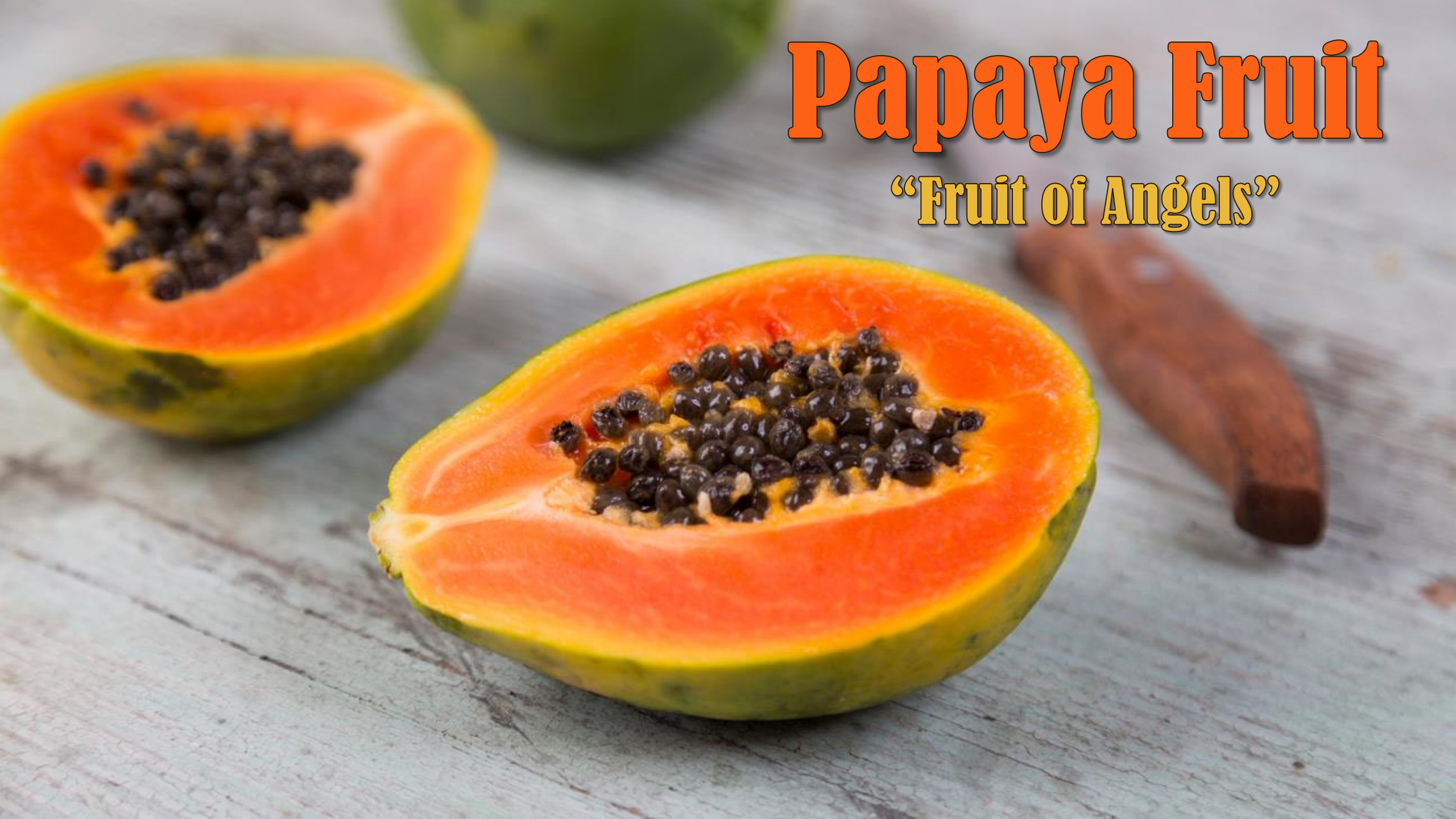
- Avocado**

- Lemon**



Papaya Fruit

“Fruit of Angels”



Active constituents

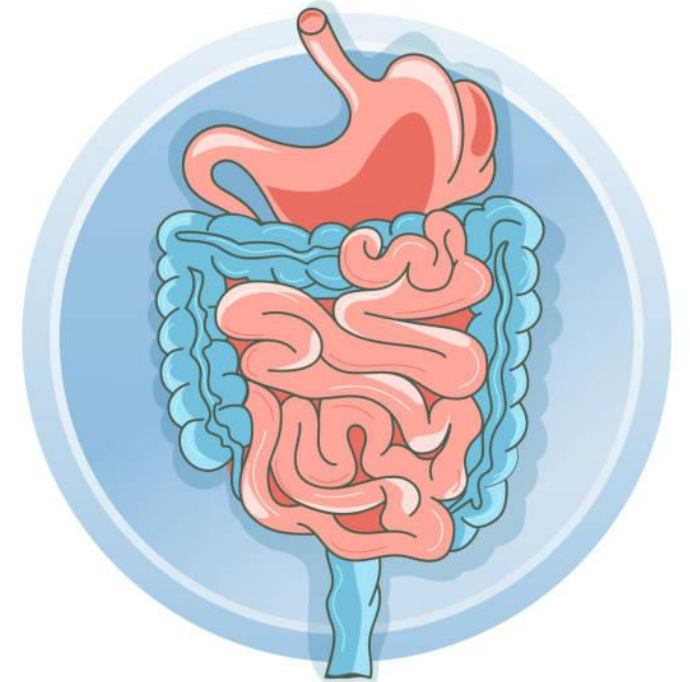
- 🕯️ Papaya fruit is a berry
- 🕯️ Papaya leaves contain **tannins**, **saponins**, **alkaloids**, and **flavonoids**; while shoots contain various minerals like **Ca**, **Fe**, **Mg**, **K**, **Zn**, **Mn** etc.
- 🕯️ **Enzymes** are present in the unripe fruit and latex such as **papain** and **chymopapain**. Fruit also contains **carotenoids**; **β carotene**
- 🕯️ **Papaya oil** is found in **seeds** and also contains **flavonoids** (**kaemferol**, and **myricetin**).
- 🕯️ Papaya is possibly rich in **vitamin C**, **A**, **E**, as well as some **B vitamins** (**folate** and **pantothenic acid**).



Uses

Aids in Digestion

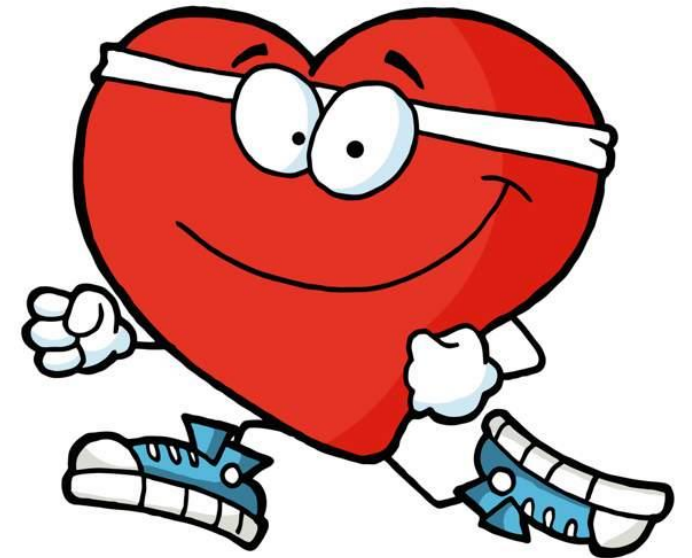
Papayas are commonly consumed for proper digestion. The presence of papain, a digestive super enzyme, improves digestion by breaking down proteins and also cleanses the digestive tract. This ensures a reduced conversion of protein into body fat.



Improves Heart Health

The [seeds](#) of papayas are [good](#) for a healthy heart. Having three powerful **antioxidant** vitamins, namely [vitamin A](#), C, and E, means papayas are helpful in **preventing problems such as [atherosclerosis](#) and diabetic heart diseases.**

The presence of pro-carotenoid phytonutrients as well as vitamins helps **prevent oxidization of cholesterol** in the body. When oxidation of cholesterol takes place, it sticks to the walls of the blood vessels and forms plaque that can lead to heart attacks and strokes.



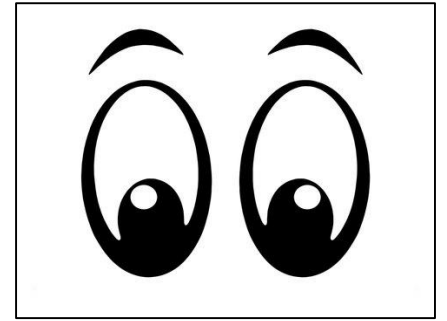
Uses

Treats Macular Degeneration

Macular degeneration is a disease of the eye. In this condition, the ocular cells degenerate, which results in blurred vision and can cause blindness as well.

This is an age-related illness and adding papayas to the diet is beneficial for reducing the risk of developing macular degeneration.

Just as [carrots](#) help improve the eyesight due to the presence of beta-carotene, papayas are also known to be effective in reducing the effect of macular degeneration.



Uses

Skin care

Papayas can be great revitalizing agents, which is why they are used in many cosmetics.

Also, papayas are used in homemade face masks by many women. The papain in them kills dead cells and purifies the skin. The beneficial properties and the healing enzymes present in papaya help treat sunburn and irritated skin.

The peels of papayas are also used to rub on the face and hands for healthy skin.

Papayas are also used to treat skin disorders like eczema, psoriasis, etc.



Uses

Other uses:

- 🍌 Relieves toothache
- 🍌 Anticancer properties
- 🍌 Anti-inflammatory effect
- 🍌 Treats constipation



Market preparations:





Lychee Fruit

“Alligator Strawberry”

Active constituents

- ❁ **Lychee fruit is a drupe**
- ❁ It is packed with health benefits and they come from the vitamins, minerals, and nutrients in the fruit, including **vitamin C, vitamin B6, niacin, riboflavin, folate, copper, potassium, phosphorus, magnesium, and manganese.**
- ❁ Furthermore, lychee is a great source of **dietary fiber, protein,** and a good source of **proanthocyanidins** and **polyphenolic compounds** such as; **Litchitannin A2.**

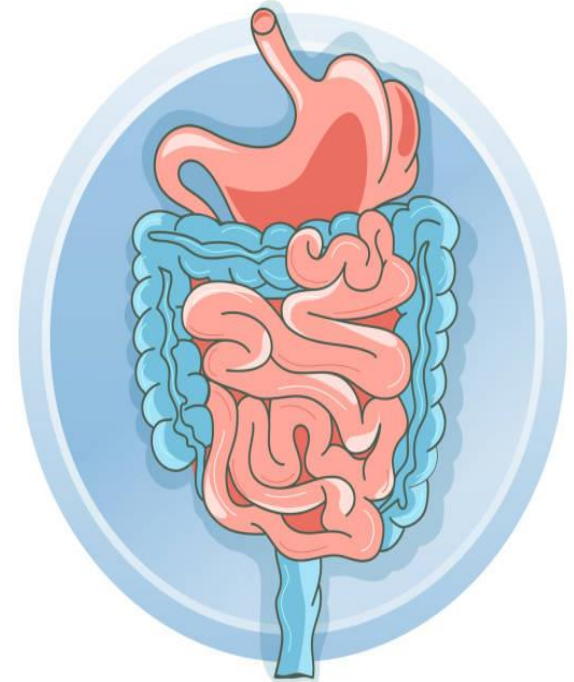


Uses:

Aids in Digestion

The significant amount of dietary fiber in lychee helps add bulk to the stool and increases digestive health. This helps bowel movements through the digestive tract smoothly, and fiber stimulates peristaltic motion of the smooth small intestine muscles, increasing the speed of food passing.

It also stimulates gastric and digestive juices, so the absorption of nutrients is efficient. This can reduce constipation and other gastrointestinal disorders.

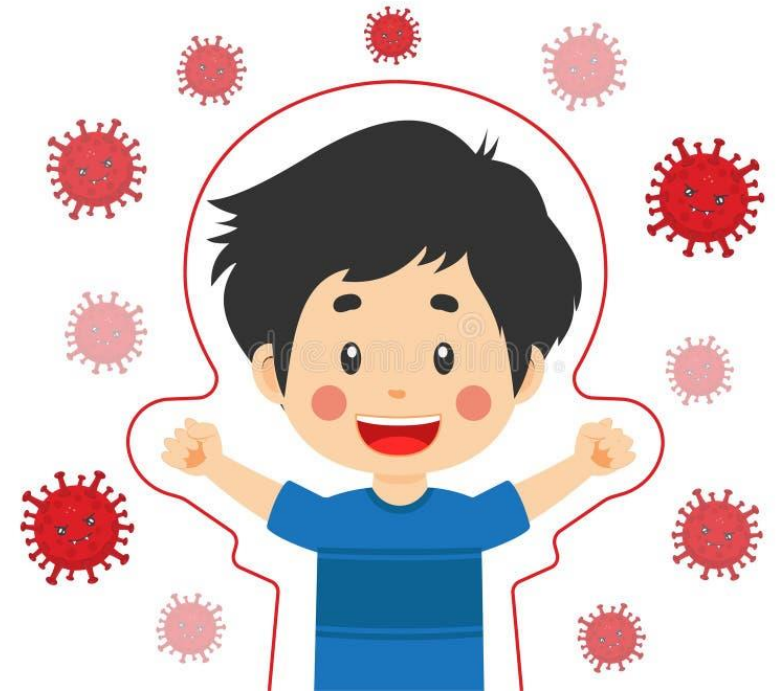


Uses:

Boosts Immunity

Perhaps the most significant nutrient in lychee is vitamin C, and this fruit has more than 100% of the daily requirement of ascorbic acid in a single serving.

This means that the immune system gets a major boost, as vitamin C is a major antioxidant compound and is known to stimulate the activity of white blood cells, which are the main defensive line of the body's immune system.



Uses:

Antiviral

The proanthocyanidins in lychee have been studied extensively, and they have also demonstrated antiviral capabilities.

Litchitannin A2 has been closely connected to preventing the spread or outbreak of viruses, including herpes simplex virus and coxsackievirus.



Uses:

Controls Blood Pressure

Lychee has a wealth of potassium, meaning that it can help the body maintain a fluid balance, which is an integral part not only of metabolic functions but also in hypertension it is also low in sodium.

Potassium is considered to be a vasodilator, meaning that it reduces the constriction of blood vessels and arteries, thereby lowering the stress on the cardiovascular system.

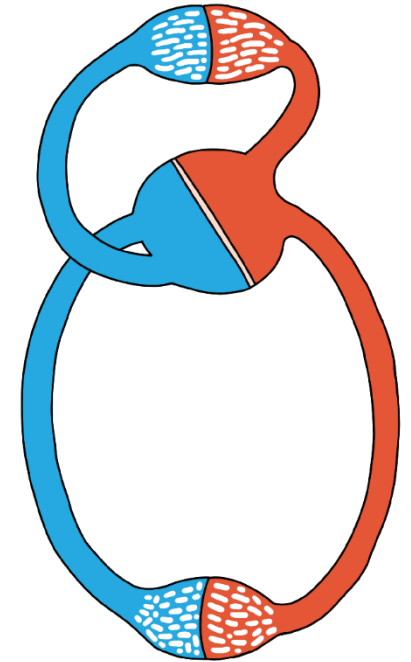
Potassium levels are almost three times higher in dried lychee rather than in fresh lychee!



Uses:

Improves Blood Circulation

Copper is another essential mineral found in considerable quantities in lychee, and although iron is most commonly associated with red blood cells, copper is also an integral part of RBC formation. Therefore, the copper content in lychee can boost blood circulation and increase oxygenation of the organs and cells.



Market preparations:



Avocado Fruit

“Alligator Pear”



Active constituents

- 🥑 Avocados are considered a “superfood” and are possibly rich in various nutrients, **vitamins, and minerals**. They are also a good source of healthy **monounsaturated fatty acids and dietary fibers**.
- 🥑 Perhaps most importantly, avocados have a unique collection of organic compounds like phytosterols, carotenoids, and flavonoids.
- 🥑 Avocados contain minerals including **Ca, Fe, Mg, K, copper, manganese, phosphorus, and zinc**.
- 🥑 They also have high levels of **vitamin A, K, C, E, B6**, thiamin, riboflavin, and niacin (vitamins B1, B2, B3, respectively).



Uses:

Relieve Arthritis Pain

The possibly anti-inflammatory properties of avocados are perhaps its most valuable attribute. Between the wide range of phytochemicals, flavonoids, carotenoids, phytosterols, fatty alcohols, and omega-3 fatty acids it contains, avocados are one of the best foods for reducing inflammation in tissues, joints, and muscles.



Uses:

Hepatoprotective

The chemicals contained in avocados appear to be very good at **reducing liver damage and improving liver health.**

Avocados may play a major role in toning up and protecting the liver from a wide variety of conditions.



Uses:

Vitamin K Deficiency

Vitamin K deficiency is not very common but may be seen in neonatal care. It may lead to a bleeding disorder known as vitamin K deficiency-related bleeding (VKDB).

This occurs mostly due to an insufficient intake of vitamin K by the mother during pregnancy. The inclusion of avocado in the diet of a pregnant woman may help in lowering the risk of VKDB in the newborn child



Uses:

Skin and Hair Care

Avocados are added to a variety of cosmetics due to their ability to **nourish the skin with essential vitamins and make it glow**. It is also used for nourishing dry and damaged hair. Many people use avocados to prepare skin and hair masks.

Above all, avocado oil provides relief from plaque psoriasis. Beta-carotene and lycopene have been connected to improving the health and tone of your skin and eliminating signs of premature aging.

Research shows that lutein and zeaxanthin may decrease signs of the aging process by protecting the skin from damage from UV rays and radiation as well as their **antioxidant properties**.



Market preparation:



Lemon Fruit

“Citrus fruit”



Citrus waste products



10 Million Tons / Year

Citrus waste products



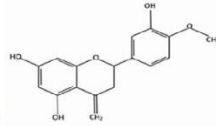
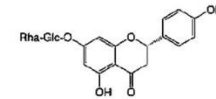
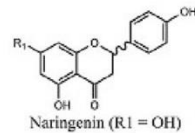
Citrus Fruit Waste



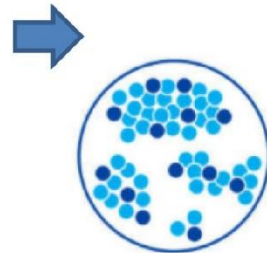
Food Uses



Food Additive



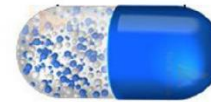
Substrate for Mushroom Production



Prebiotics

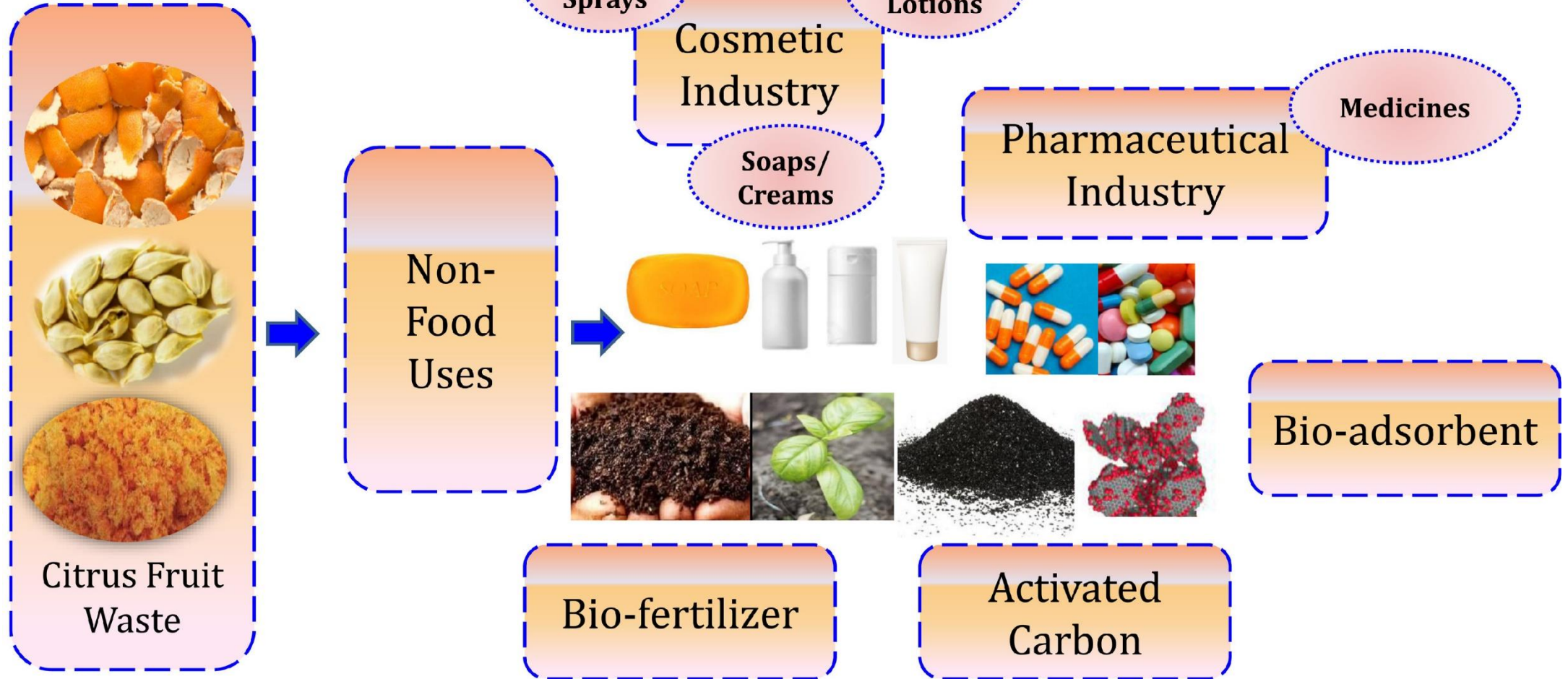


Edible Packaging Material



Encapsulating Agent

Citrus waste products



Active constituents

- 🍊 Citrus fruits are hesperidium a berry with a thick rind and a very juicy interior
- 🍊 The most important group of bioactive compounds in both *C. limon* waste products and its juice, determining their biological activity, are flavonoids such as; hesperidin and quercetin, and phenolic acids such as; sinapic and ferulic acids.
- 🍊 There are also essential oil with limonene as a major component, coumarin compounds, carboxylic acids, carbohydrates, as well as a complex of B vitamins, and, importantly, vitamin C (ascorbic acid).



Uses:

Skin Care Agent

Lemon juice, being a natural antiseptic medicine, may also be able to cure problems related to the skin.

The juice contains vitamin C, and therefore, it can be applied to reduce the pain of sunburns and bee stings as well. It is also good for acne and eczema.

Citrus juices like lemon juice act as an anti-aging remedy and may reduce wrinkles and blackheads too.

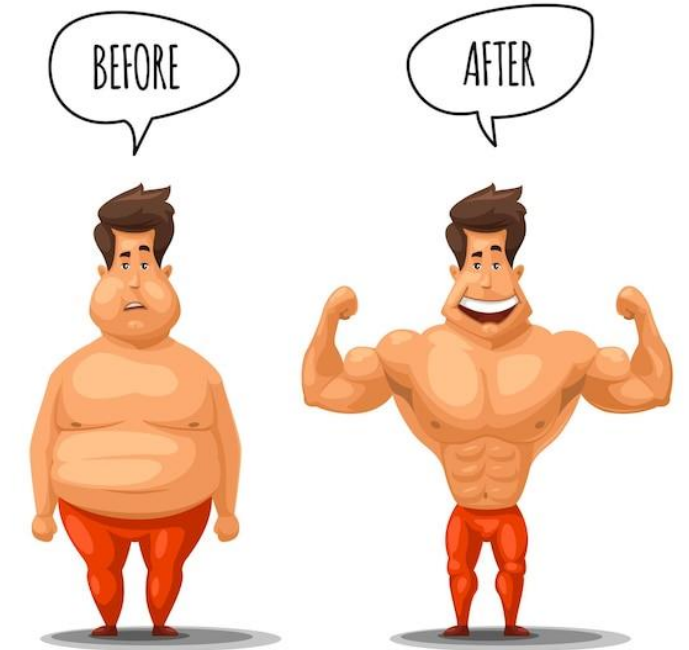


Uses:

Weight Loss



Drinking warm water with lemon and honey in the morning is said to aid weight loss efforts. While that might or might not work for everyone, a research study performed on mice confirmed that polyphenols present in it can suppress body weight gain and body fat accumulation.



This could have positive implications for lemon juice drinks in human weight loss. Lemon honey juice fasting (LHJF) might also be considered as a natural remedy for reducing weight.







Market preparations:



<u>Name</u>	<u>Active constituents</u>	<u>Uses</u>
<p><u>Papaya Fruit</u></p> 	<ul style="list-style-type: none"> <li>🕯️ <u>Enzymes</u> are present in the unripe fruit and latex such as <u>papain</u> and <u>chymopapain</u>. Fruit also contains <u>carotenoids</u>; <u>β carotene</u> <li>🕯️ Papaya oil is found in seeds also contains <u>flavonoids</u> (kaemferol, and myricetin). <li>🕯️ Papaya is possibly rich in <u>vitamin C, A, E</u>, as well as some <u>B vitamins</u> (folate and pantothenic acid). 	<ul style="list-style-type: none"> <li>• Aids in Digestion <li>• Improves Heart Health <li>• Skin care 

<u>Name</u>	<u>Active constituents</u>	<u>Uses</u>
<p><u>Lychee Fruit</u></p> 	<ul style="list-style-type: none"> • Vitamins ; including vitamin C, vitamin B6, niacin, riboflavin, folate. Minerals ; copper, potassium, phosphorus, magnesium, and manganese. • Dietary fiber, protein, and proanthocyanidins and polyphenolic compounds such as; Litchitannin A2 	<ul style="list-style-type: none"> • Aids in Digestion • Boosts Immunity • Antiviral • Improves Circulation <p>Blood</p> 

<u>Name</u>	<u>Active constituents</u>	<u>Uses</u>
<p><u>Avocado Fruit</u></p> 	<ul style="list-style-type: none"> • Vitamins ; A, K, C, E, B6, thiamin, riboflavin, and niacin (vitamins B1, B2, B3, respectively). • Minerals ; Ca, Fe, Mg, K, copper, manganese, phosphorus, and zinc. • Dietary fiber, and monounsaturated fatty acids . 	<ul style="list-style-type: none"> • Relieve Arthritis Pain • Hepatoprotective • Vitamin K Deficiency • Skin and Hair Care 

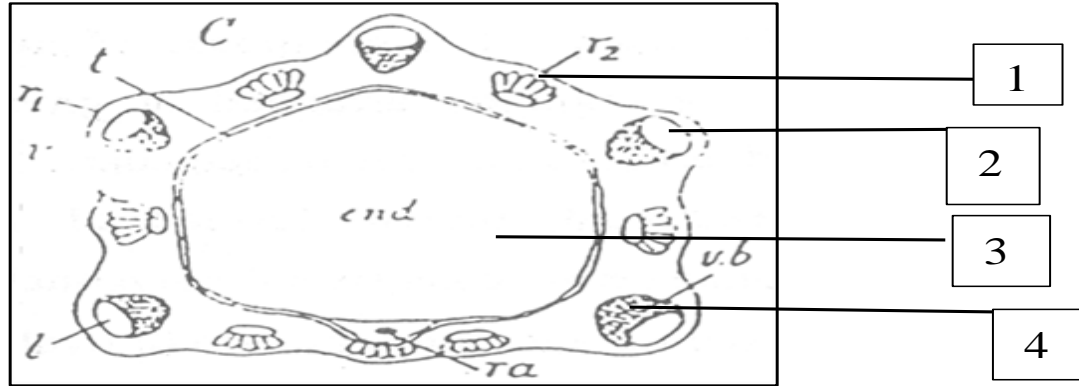
<u>Name</u>	<u>Active constituents</u>	<u>Uses</u>
<p><u>Lemon Fruit</u></p> 	<ul style="list-style-type: none"> • Flavonoids, and phenolic acids • Essential oil with limonene . • vitamin C (ascorbic acid). 	<ul style="list-style-type: none"> • Skin Care Agent • Weight Loss 

Homework

Question 2: Match Column A with the appropriate statements from columns B & C. Re-write Column A with the chosen answers in your answer paper (5marks, 0.25 mark each)

Column A	Column B	Column C
(,) Nigella	a-Capsaicin	1- It has strong lipolytic activity
(,) Colchicum	b- Physostigmine alkaloid	2- Antimicrobial & Antiviral activity
(,) Coriander	c- Sterols (e.g. β -sitosterol, β -tocopherols), squalene	3-Cardiotonic
(,) Star anise	d- Colchicine alkaloid	4- It relieves the pain and inflammation of acute gout
(,) Evening primrose	e- Volatile oil (mainly thymoquinone)	5- It relieves diabetic neuropathy
(,) Calabar beans	f-Ouabin glycoside	6-Production of bran
(,) Pumpkin seeds	g- Volatile oil mainly anethole	7- Skin disorders such as eczema, psoriasis, and acne
(,) Wheat grain	h- Volatile oil containing linalool	8- Support circulatory and immune system
(,) Capsicum	i- Protein(essential amino acids, containing sulphur)	9- Semi synthesis of rivastigmine to treat dementia in Alzheimer disease
(,) Strophanthus	j- starch, protein, vitamins A, B,B2,E, enzymes	10- Antiinflammatory, analgesic in urinary disorders

A) Identify the T.S, and answer the required questions. (5marks)



a) T.S of(1 mark)

b) 1-.....(0.25 mark)

2-.....(0.25 mark)

3-.....(0.25 mark)

4-.....(0.25 mark)

c) Suggest the uses, and contraindications of this drug. (2marks)

d) How to test for the active constituents? (1mark)





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October University for Modern Sciences and Arts
جامعة أكتوبر للعلوم الحديثة والآداب

Thank You!

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