Plants

Integrated Assessment (Chemistry & Biology)

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What's include

1

Description and Esters

Biological Characteristics about Plants and Esters and details about Fruits of each Plants

2

Table

A table summarizing every details about the plants

3

Sources

A list of Source or our references

Plants we chose

- Apple
- Pineapple
- Banana
- Lemon
- Orange

Apple

An apple is an edible fruit produced by an apple tree. Apple trees are cultivated worldwide and are the most widely grown species in the genus Malus.

Apple

Scientific Name

Malus Pumila

Plant Adaption

Mesophytes

Types of Seed Dispersion

Animals

Habitat

Full Sun / Well drained loamy soil

Commercial Usage

- Ingredients for Food products such as Apple Juice and Candy
- Used as medicine to control diarrhea or constipation

Unique Features and Function

- Apple trees are deciduous
  * conserve water or to better survive winter weather conditions
- Deep taproots
  * sustain the tree during times of drought and scarcity of nutrients.

Apple

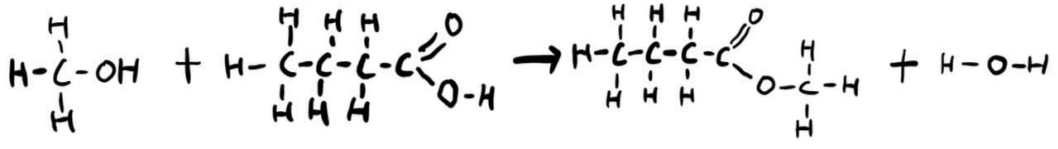
Fruit: Apple

Ester: Methyl Butanoate

Formula:

$$CH_3OH + C_3H_7COOH \rightarrow C_3H_7COOCH_3 + H_2O$$

(Methanol) + (Butanoic Acid) → (Methyl Butanoate) + (Water)



Pineapple

The pineapple is a tropical plant with an edible fruit and is the most economically significant plant in the family Bromeliaceae. The pineapple is indigenous to South America, where it has been cultivated for many centuries.

Pineapple

Scientific Name

Ananas Comosus

Plant Adaption

Xerophytes

Habitat

Tropical

Types of Seed Dispersion

Vegetative Propagation

Commercial Usage

- Canned pineapple
- Dried pineapple such as ingredient in bread

Unique Features and Function

- Axillary Roots
  * direct absorption of water and nutrients
- leaves grow spirally around the stump
  * increase water intake and absorb sunlight

Pineapple

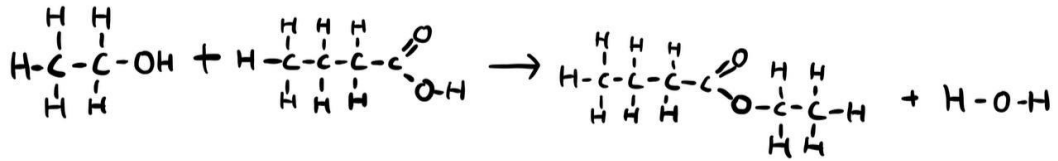
Fruit: Pineapple

Ester: Ethyl Butanoate

Formula:

$$C_2H_5OH + C_3H_7COOH \rightarrow C_3H_7COOC_2H_5 + H_2O$$

(Ethanol) + (Butanoic Acid) → (Ethyl Butanoate) + (Water)



Banana

A banana is an elongated, edible fruit – botanically a berry – produced by several kinds of large herbaceous flowering plants in the genus Musa.

Banana

Scientific Name

Musa Acuminata

Plant Adaption

Mesophyte

Types of Seed Dispersion

Vegetative Propagation

Habitat

Tropical; Loamy Sandy Soil

Unique Features and Function

- Fibrous and spreading roots
  *Helps the plant hold onto the soil even when laden with fruit
- Large leaves
  *Adapt at catching sunlight in dappled canopies

Commercial Usage

- Used in food items such as banana fritters, banana split
- Leaves are used to serve and pack food

Banana

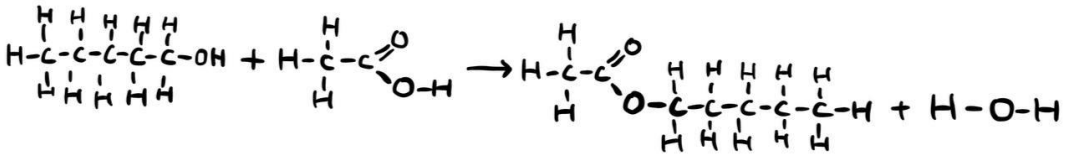
Fruit: Banana

Ester: Isoamyl Acetate

Formula:

$$C_5H_{11}OH + CH_3COOH \rightarrow CH_3COOC_5H_{11} + H_2O$$

(Isoamyl Alcohol) + (Acetic Acid) → (Isoamyl Acetate) + (Water)



Lemon

The lemon is a species of small evergreen tree in the flowering plant family Rutaceae, native to Asia, primarily Northeast India, Northern Myanmar or China.

Lemon

Scientific Name

Citrus limon

Plant Adaption

Mesophyte

Types of Seed Dispersion

Animals

Habitat

Subtropical or tropical; Well drained, Sandy loam soil

Commercial Usage

- Ingredient in food products such as lemon meringue pie, lemon juice
- Acts as a cleaning agent

Unique Features and Function

- Strong scent
  * Attracts insects which are their main pollinators
- Edible fruits and seeds
  * Allows the seeds to pass through the animal's digestive system that will be released in a different location

Lemon

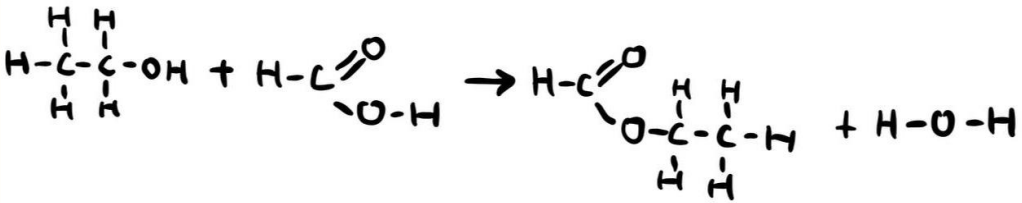
Fruit: Lemon

Ester: Ethyl Formate

Formula:

$$C_2H_5OH + HCOOH \rightarrow HCOOC_2H_5 + H_2O$$

(Ethanol) + (Formic Acid) → (Ethyl Formate) + (Water)



Orange

The orange is the fruit of various citrus species in the family Rutaceae; it primarily refers to Citrus × sinensis, which is also called sweet orange, to distinguish it from the related Citrus × aurantium, referred to as bitter orange.

Orange

Scientific Name

Citrus Sinensis

Plant Adaption

Mesophytes

Types of Seed Dispersion

Animals / Fallen fruit

Habitat

Humid subtropical climates

Unique Features and Function

- Flower produces a fragrant smell along with nectar
  * attracts organisms such as birds or bees which helps pollinate the trees
- surfaces of fruit and leaves is full of oleaginous glands
  * gives the orange its characteristic smell

Commercial Usage

- Ingredient in food roducts such as orange juice
- Used as an ingredient for Vitamin C Tablet

Orange

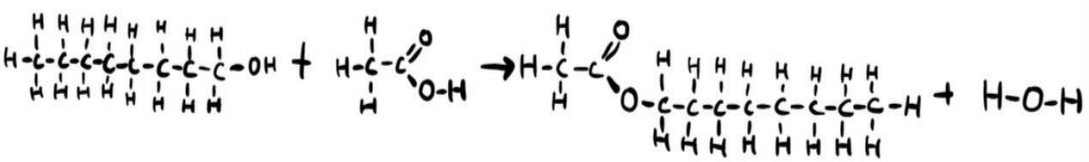
Fruit: Orange

Ester: Octyl Acetate

Formula:

$$C_8H_{17}OH + CH_3COOH \rightarrow CH_3COOC_8H_{17} + H_2O$$

(Octyl Alcohol) + (Acetic Acid) → (Octyl Acetate) + (Water)



No.	Plants	Scientific name	Fruits	Habitat	Plant Adaptation based on its habitat	Unique feature of plant (most important) and its function		Type of dispersion	Ester	Commercial usage
						Unique feature	Function			
1	Apple	Malus Pumila	Apple	Full Sun; Well drained loamy soil	Mesophytes	- Deciduous - Deep Taproots	- Conserve water or to better survive winter - Sustain the tree during times of drought and scarcity of nutrients	Animals	Methyl Butanoate	- Ingredients for food products such as Apple Juice - Used as medicine to control diarrhea
2	Pineapple	Ananas comosus	Pineapple	Tropical	Xerophytes	- axillary roots - leaves grow spirally around the stump	- direct absorption of water and nutrients - increase water intake and as absorb sunlight	vegetative propagation	Ethyl butanoate	- canned pineapple - dried pineapple such as ingredient in bread
3	Banana	Musa acuminata	Banana	Tropical; Loamy sandy soil	Mesophyte	-large leaves -fibrous and spreading roots	- Adapt at catching sunlight in dappled canopies - Helps the plant hold onto the soil even when laden with fruit	Vegetative Propagation	Isoamyl acetate	- Used in food items such as banana fritters, banana split - Leaves are used to serve and pack food
4	Lemon	Citrus Limon	Lemon	subtropical or tropical; well-drained, sandy loam soil	Mesophyte	- Strong scent - Edible fruits and seeds	- Attracts insects which are their main pollinators - Allows the seeds to pass through the animal's digestive system that will be released in a different location than where it was consumed.	Animals	Ethyl Formate	- Ingredient in food products such as lemon meringue pie, lemon juice - Cleaning agent
5	Orange	Citrus Sinensis	Orange	Humid subtropical climates	Mesophytes	- Flower produces a fragrant smell - Surfaces of fruit and leaves is full of oleaginous glands	- attracts organisms such as birds or bees which helps pollinate the trees - Gives its characteristic smell	Animals, Fallen fruit	Octyl acetate	-Orange Juice -Vitamin C tablets

Table

Sources of references

Apple
Source 1
Source 2
Source 3
Source 4
Source 5
Source 6

Pineapple
Biology Form 5 KSSM
Chemistry Form 5 KSSM
Source 3
Source 4
Source 5
Source 6

Banana
Source 1
Source 2
Source 3
Source 4
Source 5
Source 6
Source 7

Lemon
Source 1
Source 2
Source 3
Source 4
Source 5
Source 6
Source 7

Orange
Source 1
Source 2
Source 3

* You can click on the link to view the webpage.

Thank You.