

A Short Concept on *M. indica* as Flavouring Agent

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INTRODUCTION

Mango (*M. indica*) is called King of Fruits (R9). It has high nutritional value and health benefits due to its important components. It is a drupe or stone fruit, which means that it has a large seed in the middle. It is native to India & Southern Asia and people have been cultivating it for over 4000 years. Hundreds of types of mangoes exist each with its own character, taste, shape, size, and colour (R10, R3). The fruit is not only delicious but also boasts an impressive nutritional profile. To find out the main components of mango flavour and its nutritional value following study is undertaken.

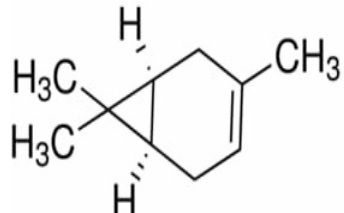
Mango is very nutritional as one cup of (165gm) of fresh mango provides calories/gm

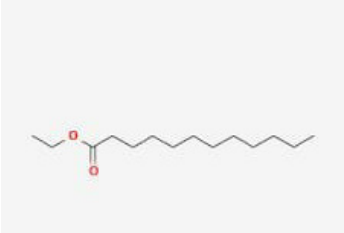
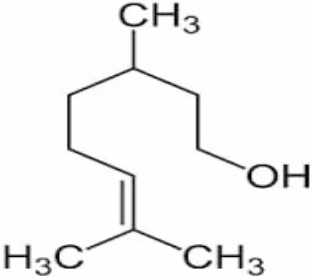
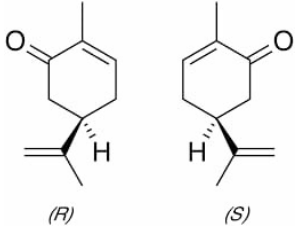
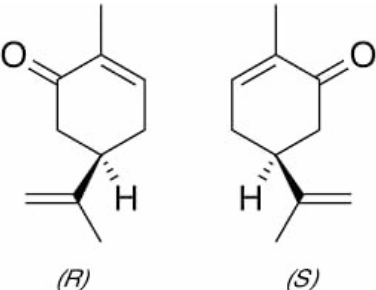
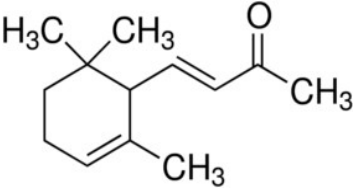
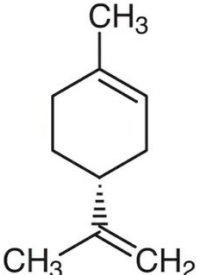
Table 1

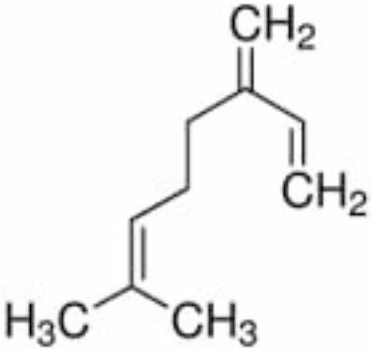
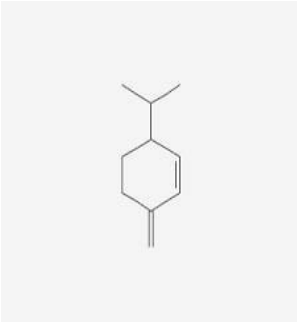
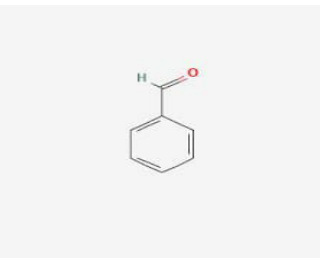
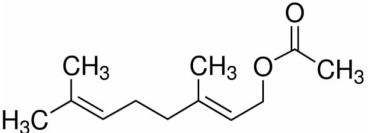
Substances	Per gm/Daily value (DV)
Calories	99
Protein	1.4 g
Carbohydrates	24.7g
Niacin	7 %
Potassium	6%
Riboflavin	5%
Magnesium	4%
Thiamine	4%
Fat	0.6g
Fibre	1.6g
Vitamin	67%
Copper	20%
Folate	18%
Vitamin B6	12%
Vitamin A	10%
Vitamin E	10%
Vitamin K	6%

Mango Flavour Compounds: The mango flavours (R3, R4) overall are contributed to by a whole host of different volatile flavour compounds. These are –

Table -1

Compound	Characters	Structure
3 Carene	<p>3-Carene is a bicyclic monoterpene consisting of fused cyclohexene and cyclopropane rings. It occurs as a constituent of turpentine, with a content as high as 42% depending on the source. It has a sweet and pungent odour.</p> <p>Density- 0.86g/cm³. Chemical formula-C₁₀H₁₆ Boiling point- 170-172°C</p> <p>A fruity-smelling terpene 3-carene is found in the flavours of several herbs and spices including angelica, anise, basil, bergamot</p>	

Ethyl dedecanoate	Also known as Ethyl laurate or late ethyl ester, belongs to the class of organic compounds known as fatty acid esters. Chemical formula C ₁₄ H ₂₈ O ₂ . It is an aliphatic acyclic compound. av. Molecular weight- 228.3709 A long chain ester is also known as ethyl laurate interestingly it is found in several alcoholic spirits including cognac, malt whisky and dark rum.	
Hexyl hexanoate	Molecular formula C ₁₂ H ₂₄ O ₂ Also known as hexanoate ester obtained by the formal condensation of the carboxy group of hexanoic acid.	$\begin{array}{c} \text{O} \\ \\ \text{CH}_3(\text{CH}_2)_4\text{C}-\text{O}(\text{CH}_2)_5\text{CH}_3 \end{array}$
Citronellol	Main aroma compound. It is a monoterpene that is oct-6-ene substituted by a hydroxy group at position 1 and methyl groups at position 7. It has a role as a plant metabolite. Molecular formula- C ₁₀ H ₂₀ O	
Carvone	A spicy smelling compound. It is a member of a family called terpenoids. Carvone is found naturally in many essential oils but is most abundant in the oils from seeds of caraway, spearmint and dill. Formula- C ₁₀ H ₁₄ O. Molar mass -150.22g/mol, boiling point- 231°C, Density- 960kg/m ³	
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α-Ionone	It is a colourless liquid fragrance ingredient. Boiling point 237-238°C. Floral odours, molecular wt. 192.30. Rose ketones flavouring agents are also found in rose, carrots.	
Limonene	It is a monoterpene that is cyclohex-1-ene substituted by a methyl group at position 1 and a 1-en-2-yl group at position 4 respectively. It has a role as a human metabolite. It derives from a hydride of a p-menthane. Molecular wt.-C ₁₀ H ₁₆ . Molar mass- 136.23 Major aroma compounds are also found in Lemon, Orange.	

Myrcene	Myrcene or B-myrcene is an alkene natural hydrocarbon. It is more precisely classified as a monoterpene. These are dimers of isoprenoid precursors and myrcene is the primary component of South African <i>Adenandra villosa</i> (50%), also in bay leaf, cannabis and hops.	
B-Phellendrene	Organic compounds that have similar molecular and chemical structures as Alfa or Beta- Phellandrene. Both are monoterpenes, double bonds endocyclic. Molar mass- 136.24g/mol Formula-C ₁₀ H ₁₆ , Boiling point- 171°C Density-0.846 g/cm ³ A peppery estuary smell found in <i>Eucalyptus</i> , <i>Oenanthe aquatica</i> plant.	
Benzaldehyde	Also known as carbaldehyde, consist of benzene bearing a single formyl substitute. It has a role as a flavouring agent, fragrance. Its molecular formula- C ₆ H ₅ CHO Found in apricots, cherries.	
Geranyl acetate	A natural organic compound, classified as monoterpene, colourless liquid with a floral aroma. C ₁₂ H ₂₀ O ₂ . Molar mass- 196.29g/mol. Density-0.916 g/cm ³ at 15°C. Melting point- 25 °C. A floral smelling ester	

From Table 1 it is found that one cup of fresh mango (165gm) provides 67% of the Daily Value (DV) for Vitamin

C. This water-soluble Vitamin aids the immune system, helps the body absorb Fe and promotes cell growth and repair. It is also a good source of copper and folate which is helpful during pregnancy (R2). act as antioxidants and provide vitamins and minerals.

It prevents diabetes as it is content with polyphenol. So, acts as an antioxidant and protects the body (R2). It also has Mangiferin, Gallic acid, Catechin, Anthocyanin, Camphor, Rhamnetin, Benzoic acid. They protect our cells from free radicals. Mangiferin is called a super antioxidant and contains immune-boosting

nutrients. It has vitamin A essential for a healthy immune system which protects our body and increases WBC (R2). The presence of digestive enzymes in mango improves digestive health (R3). It has an anti-cancer effect and has a pH of 5.8 – 6.

CONCLUSION

Mango fruit is an important source of macronutrients such as carbohydrates, lipids and fatty acids, protein and amino acids and organic acids. Also, mango has micronutrients such as vitamins and minerals and finally non-nutrient compounds such as phenolic compounds, flavonoids and other polyphenols, chlorophylls, carotenoids and volatile compounds. The

nutritional and non-nutritional and water contents of mango fruits vary depending on the cultivar and several preharvest and post-harvest factors. Phenolic compounds are plants' secondary metabolites that form part of the human diet and are of significant importance because of their biological abilities and health benefits (R1, R6). Mango pulp includes the two major categories of phenolic acids in plants, hydroxybenzoic acids, and hydroxycinnamic acid derivatives. (R5, R8). This study is purely on reference based to highlight the nutritional value and benefits of eating mango in our daily diet.

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