



Mini Review

Nutritional and Health Benefits of Mango (*Mangifera indica* Linn); A mini-Review

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ABSTRACT

Mangoes are among the most popular fruits in the world because of their mouthwatering flavor, vibrant color, and inviting aroma. It belongs to the Anacardiaceae family and has many different varieties and health benefits. It has a strong nutritional profile and flourishes in tropical climates. Numerous studies conducted all around the world have shown that *Mangifera indica* Linn has a variety of medicinal and nutritional benefits. It has a specific nutritional and phytochemical content. Mango trees' many components offer a variety of advantages. There are a wide range of pharmacological, therapeutic, and numerous health benefits provided by the flower, seeds, leaves, bark, and raw as well as ripe fruits. Mangoes have higher levels of macronutrients and micronutrients, as well as a variety of bioactive chemicals found in various plant parts. For instance, mangiferin is a mango's main active ingredient. In this review article, we looked into a variety of mango benefits, such as its anti-inflammatory, anti-cancer, anti-diabetic, anti-bacterial, and gastrointestinal health benefits.

INTRODUCTION

Mango cultivation has been practiced in India for over 4,000 years. The mango is the tropical fruit that people eat the most as a dessert. The Anacardiaceae family, which the mango belongs to, also contains a number of extremely hazardous species. It has tremendous dietary value, flavor, and scent. In the twenty-first century, mango production keeps it as the most popular tropical fruit [1]. Mango production reached 51 million tonnes globally in 2019. Asia produces the majority of the world's mango crop, particularly India, which continues to be the top exporter

with annual production reaching 22 million tonnes [1, 2]. India exported roughly 36,000 tonnes of mangoes and 129,000 tonnes of pulp in 2015–2016 due to the growing demand for fresh and processed mango products abroad [1]. Worldwide, 85 countries grow mangoes; 80 percent of the crop is produced in Asia, primarily in India, China, Thailand, and Indonesia. Mangoes contain a combination of sugar (16–18% w/v), acids, and significant levels of both polyphenols and ascorbic acid, two powerful antioxidants (carotene, as vitamin A). Green, immature, and mature, ripe

mangoes require distinct types of primary carbohydrates [3]. Green mangoes' main source of carbohydrates is starch, which matures into lowering sugars (sucrose, glucose, and fructose). Ripe mangoes also contain trace amounts of cellulose, hemicellulose, and pectin in addition to these carbs [4]. Unripe mangoes have a sour flavor because to the presence of many acids, including citric acid, malic acid, oxalic acid, succinic acid, and other organic acids. In contrast, the ripened fruit's sweetness is the result of a combination of decreasing sugar and malic acid, the main acid source [4]. The high quantities of β -carotene and other phytochemicals in mangoes can halt the progression of leukaemia, prostate, breast, and colon cancer [5–9]. The three components of a mango: the seed kernel, the epicarp, and the pulp, or mesocarp (endocarp).

NUTRITIONAL PROFILE

The unique flavor and nutritional value of the mango contribute to its popularity as a fruit. Vitamins A, B, and C are among the many vitamins that are said to be abundant in it. Malic, citric, and tartaric acids are additional ingredients that are present in a mango in little amounts as shown in table 1. Mangoes have a good amount of fiber, which helps with many gastrointestinal conditions. Mango seed fat has been approved by the European Union as a substitute for cocoa butter and other nutraceuticals. Obesity, diabetes, chronic gastrointestinal disorders, and cardiovascular diseases are all related with a lower incidence of disease when dietary fiber is present [10, 11].

Nutrients	Quantity
Fat	0.4g
Carbohydrates	28.1g
Vitamin C	45.7mg
Vitamin E	1.8mg
Protein	0.82g
Vitamin C	45.7g
Calcium	16.5g
Phosphorus	18.2mg
Magnesium	14.8mg

Table 1: Nutrient composition of Mango Fruit per 100 g

Pharmacological Effects of Mango

Numerous pharmacological effect of Mango are depicted in Figure 1.



Figure 1: Health Benefits of Mango

Mangiferin

The mango tree's fruit, leaves, bark, and roots all contain the chemical mangiferin. Mangiferin has a variety of advantageous properties, including as antioxidant activity and a pro-hypoglycemic role. Additionally, it plays a significant part in keeping cholesterol levels stable and preventing TNF expression [12].

Antioxidant

Reactive oxygen species can induce oxidation, which can change the composition, structure, and function of biological substances such as lipids, proteins, and DNA (ROS). Mangiferin is a possible iron chelator with antioxidant and anti-hydroxyl radical properties [13, 14].

Anti-Diabetic

Mangiferin is involved in controlling insulin resistance and glucose metabolism. In mice predisposed to diabetes, mangiferin treatment significantly reduced plasma glucose and lipid levels. Treatment with mangiferin can stop diabetic rats' kidneys from fibrosing, lower their levels of collagen IV, and lower their levels of IL-1 [15].

Anti-Bacterial

Significant antibacterial activity has been observed for mango extract against numerous microorganisms. Additionally, E was the target of the activity. *Salmonella*, *E. coli*, and *Listeria monocytogenes*. Mangiferin and gallotannin are suggested to be the cause as they are present in the extract [16].

Gastroprotective Health

Mangiferin is produced by the intestinal bacteria in the colon and has therapeutic effects. It can effectively eliminate the *H. pylori* bacteria, reduce GI inflammation, and guard against stomach cancer. Inflammatory indicators such TNF, NF- κ B subunit, IL-1, p65, and IL-8 were suppressed by mangiferin [17, 18].

Anti-Cancer

The presence of many bioactive chemicals in various sections of *Mangifera indica* has been linked to the anti-cancer effect of mango. In addition to preventing GI inflammation and stomach cancer, mangiferin can eliminate the *H. pylori* bacterium. For gastroprotective health, a diet high in mangiferin or supplements may be helpful [19, 20].

CONCLUSIONS

Since the beginning of time, plants have been used as important sources of medicine because of their capacity to improve health, address deficits, and meet physiological needs. Every portion of a variety of plants contains nutrients and metabolites that are very important for medicinal purposes. The usage of plant extract for this purpose has increased. Mango, the king of fruits, is one of these crucial medicinal plants. The results of the current review indicate that the nutrients and phytochemicals in

mangoes are helpful in preventing pro-inflammatory molecules, diseases including cancer, maintaining gastrointestinal health, and battling diabetes. In addition to its medicinal properties, mango has been shown to provide important nutritional advantages for human health.

Conflicts of Interest

The authors declare no conflict of interest.

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