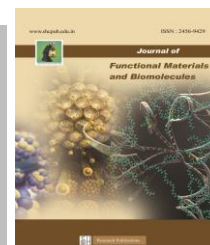




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A REVIEW ON *Actinidia deliciosa* VALUABLE MEDICINAL FRUIT

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Abstract

Kiwi fruit (*Actinidia deliciosa*) belongs to the family Actinidiaceae and genus *Actinidia*. It is one of the most commercialized fruits on the international front and is loaded with many nutrients such as vitamins, minerals and phytochemicals and its parts are well recognized for their medicinal and therapeutic properties against various diseases. Being a significant source of phytochemicals including caffeic acid, gallic acid, syringic acid, salicylic acid, ferulic acid, and protocatechuic acid; it contributes to the major flavonoid and phenolic contents of kiwi fruit. The fiber present in kiwi fruit favors its water retention capacity which further aids in decreasing the transit time and maintains gastrointestinal health of the individual. Investigations are also being done on the insulin and glucose balance, weight maintenance and homeostatic balance to kiwi fruit consumption. The present study review of literature to establish medicinal properties of *Actinidia deliciosa* which makes it well suited for therapeutic interventions as well as food applications.

Keywords: *Actinidia deliciosa*, Phytochemicals, Therapeutic interventions and Nutrients.

1. Introduction

Fruits are the mature, ripened ovary (reproductive part of plant) which is therefore consumed as a whole. Fruits are an integral part of the daily human diet with 3-5 servings per day as fruits provide wide range of vitamins, minerals, fiber and phytochemicals. Fruits contain small quantities of macromolecules such as protein or fats but are largely flushed with vitamins, minerals and sugars which make them as valuable as other plant produced species [1]. Among all the climacteric and nonclimacteric fruits available, one of the most nutrient dense fruit is Kiwi (*Actinidia deliciosa*). Kiwifruit belongs to family Actinidiaceae and genus *Actinidia* which has 76 species and approximately 125 known taxa. Most commonly available species are *Actinidia deliciosa* (fuzzy or green kiwifruit) and *Actinidia chinensis* (golden kiwifruit) which are grown commercially. Though green and gold kiwifruit differ greatly in color, texture, and taste [2].

It is also known as Makaku Peach Mihautau or Chinese gooseberry. The plant itself is deciduous vine that grows 9 feet in height and grows well in shade as well as in full sunlight. Plant can be found at a height of 800 to 1500 m with average rainfall of 150 cm/ year. Kiwifruit grows well in deep well drained sandy loamy soil with pH range of 6.9 to 7.3 with minimum of irrigation required after 10 to 15 days. Fruit is small in size approximately 3 inches long, with hairy skin (brown colored) and green fleshy mesocarp along with full of small black edible seeds of kiwi with sweet and tangy flavors [3]. Other species of *Actinidia* include: *Actinidia arguta* (baby kiwifruit), *Actinidia kolomikta* (Arctic kiwifruit), *Actinidia purpurea* (purple kiwifruit), *Actinidia polygama* (silver vine), *Actinidia eriantha* (Velvet vine) and *Actinidia melanandra* (red kiwifruit). The species *Actinidia arguta*, *Actinidia Kolomikta* *Actinidia purpurea* can also grow in cooler regions due to their frost resistance. Among all these species, *Actinidia deliciosa*, the fuzzy kiwifruit has larger fruit size and productivity, lower respiration rate and ethylene sensitivity and thus longest storage [4].

2. Description

The species *Actinidia chinensis* has a smooth, bronze skin, with a beak shape at the stem attachment. Flesh colour varies from bright green to a clear intense yellow. This species is sweeter and more aromatic in flavor. The yellow fruit fetches a higher market price and, *deliciosa*. *Actinidia melanandra* berries have a smooth texture and can be consumed as a whole. Hybrid cultivar *Actinidia arguta* and *Actinidia melanandra* 'Ken's Red' is a well-known cultivar. Berries of *Actinidia melanandra* accumulate different biologically active compounds [6]. The Table 1 shows the scientific classification and Fig.1: shows the *Actinidia deliciosa* and its different varieties as below,

3. Composition of Kiwi Fruit

The chemical composition of kiwi is of significant interest to those wishing to comprehend the nutritional value and potential health benefits of using this fruit. The composition of fruit has been considered primarily in terms of the nutritive components including protein, li-

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pids, carbohydrates, vitamins A, C, and E and folic acid, minerals, polyphenols, antioxidants, and dietary fiber. The various bioactive polyphenols present in kiwi include caffeic acid and other chlorogenic derivatives, syringic acid, ferulic acid, gallic acid, salicylic acid, procatechuic acid, quercetin, glycosides, coumaric acid and procyanidins [7].

4. Health Benefits Of Kiwi Fruit:

4.1. Anti - Digestive Activity:

Kiwifruit stores a good amount of proteolytic enzyme actinidin a protein-dissolving enzyme which improves the digestion of proteins and can help digest a meal much like the papain in papaya or bromelain in pineapple. It facilitates smooth traffic through the digestive system [8].

4.2. Anti-Diabetic Activity:

Kiwi has low glycemic index which makes it suitable for the individuals with diabetes. In addition, fiber-rich foods, like kiwifruit, are good for keeping the blood sugar levels of diabetic patients under control [9].

4.3. Anti - Skin Activity:

It is a good source of vitamin C which is essential nutrient that works in our bodies as an antioxidant to help prevent damage caused by the sun, pollution and smoke, smooth wrinkles, keep the skin young ,vibrant and improve overall skin texture[10]. It also a good source of vitamin E which makes the skin soft and moist and protect the skin from degeneration. Vitamins also aids in regeneration of cells which in turn makes the skin youthful and flexible. The vitamin C is the responsible for the formation of collagen. Collagen is a connective protein repairs the skin and keeping the skin firm and supple .It helps it to recover from cuts and wounds and prevent from rough and dry skin [11].



Fig. 1: *Actinidia deliciosa* and its different varieties

4.4. Heart Disease Activity:

The fibre and potassium in kiwis support heart health. Fiber can reduce high cholesterol levels, which may reduce the risk of heart disease and heart attack. Poor magnesium status is associated with heart disease, myocardial infarction and hypertension. Fresh kiwi fruit is a very rich source of heart-healthy electrolyte “potassium.” 100 g contains 312 mg or 7 per cent electrolyte. An increase in potassium intake along with a decrease in sodium intake is the most important dietary change that a person can make to reduce their risk of cardiovascular disease [12]. Potassium is an important component of cell and body fluids that help regulate heart rate by countering malefic effects of sodium. The Fig.2: shows the Health benefits of Kiwi fruit as below,

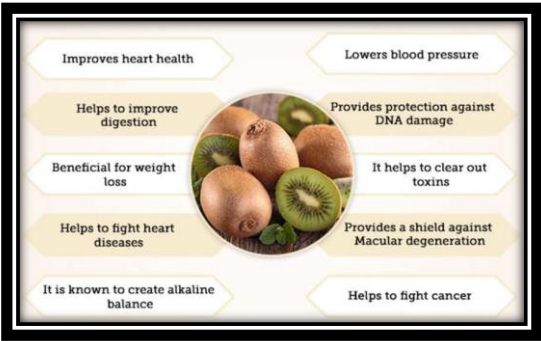


Fig.2: Health benefits of Kiwi fruit

Table 1 : Scientific Classification

Kingdom	Plantae
Clade	Tracheophytes
Clade	Angiosperms
Clade	Eudicots
Clade	Asterids
Order	Ericales
Family	Actinidiaceae
Genus	Actinidia
Species	A. deliciosa

4.5. Cardiovascular Activity:

Kiwifruit is a good source of protective polyphenols along with vitamin C, vitamin E and potassium. These are effective in the maintenance of cardiovascular health [13]. Kiwifruit exerts inhibitory activities which aids in the reduction of triglycerides in the blood. Pregnant women’s health: It is a good source of folate (vitamin B6), which is beneficial for pregnant women because it helps in the development of the foetus, making it healthy. It is also considered to be good for growing children [14].

4.6. Anti-Cancer Activity:

The consumption of Kiwifruit works against cancer by being cytotoxic to malignant cancer cells without affecting the normal, healthy cells. The great amount of dietary fibre in kiwi fruit helps in decreasing the

probability of colon cancer [15]. Kiwifruit has been shown to contain an antimutagenic component, helping to prevent the mutations of genes that may initiate the cancer process. It contains Catechin, a phytochemical which helps in reducing the toxicity of anti-cancer agents by stimulating the bone marrow proliferation [16].

4.7. Pharmacologic Activity:

Several research studies have been conducted by different researchers to explore the pharmacological profile and health benefits of kiwi. It has been reported to exhibit numerous biological activities such as anti-oxidant, anti-diabetic, anti-inflammatory, anti-hypertensive, anti-carcinogenic, antifungal, antiviral, anti-asthmatic, hepatoprotective, anti-platelet, anti-nociceptive, anti-HIV, anti-microbial, anticonstipation, cytotoxic, anti-tumor and anti-thrombin [17]. It possesses various health benefits owing to its rich pharmacological profile. It plays a significant role in improving metabolic abnormalities such as dyslipidemia, low-density lipoprotein, triglycerides, hypertension, abnormal glucose metabolism, vascular inflammation, and hemostatic disorders [18].

4.8. Antimicrobial Activity:

The drug resistant microbial strain of bacteria, virus, fungi and yeast necessitates the need of conducting studies on the antimicrobial and antiviral efficacy of food products. Kiwi fruit is also a rich source of phytochemicals due to the presence of which it exhibits antimicrobial and antiviral properties [19]. Along with various therapeutic properties, the bioactive compounds of kiwi fruit could have antimicrobial properties. Kiwi is rich in various strong antioxidant compounds like lutein, vitamin C, phenolics, carotenoids, chlorophyll, flavonoids which contributes to the high antioxidant potential of this fruit [20].

5. Conclusion

It can be concluded that the Kiwi fruit is not available throughout the year; therefore, attempts can be made in the development of kiwi-based processed foods. It's processing as well as preservation can be used as a weapon in the enhancement of employment opportunities for the rural population. Various studies have revealed the excellent pharmacological profile of kiwi fruit. Further research is still required in this field to attract the food industrialists for the value-addition and development of kiwi-based food products. It might help in the development of incredible pharmacological products and nutritional supplements for the welfare of mankind. Kiwi fruit has achieved a steady position in the market of fresh fruits due to various aspects like convenience, good taste, health, and visual properties. There has been a rapid growth in the development of functional foods, nutraceuticals, beverages, and desserts. Kiwi fruit products include drinks, confectionery, yogurts, soaps, shampoos and other cosmetic products.

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Conflict of Interest: Nil

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