

# Energizing Effectiveness of Cucumber (Khayarain) For Health. A Review Article

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## Abstract.

Natural Plants are basic source of food and energy for Human being. Cucumber which is consumed in different ways like sweet, vegetable and salads. Cucumber (*Cucumis sativus*) belongs to cucurbitaceae family possess antibacterial, antimicrobial, antifungal characteristics and showed activities like antioxidant, phytochemical and hypoglycaemic activity. Cucumbers, a fruit have numerous benefits internally, externally. As a food, cucumbers offer superior hydration, as they are about 95% water. They have been used for decades for their anti-inflammatory benefits on skin, soothing properties for digestion, and other therapeutic uses. The following contribution offers an overview of cucumbers, specifically, their use to augment cellular water and address common conditions i.e.: skin discoloration and aging, cardiovascular and cancerous diseases, bone health, inflammation, and connective tissue disorders.

**Key Words:** Cucumber, pharmacological activities of Cucumber, Skin care, nutraceuticals, nutrition, anti-aging, Hypoglycemic and Antihyperlipidemic activities of Cucumber.

## A. INTRODUCTION

Cucumber (*Cucumis sativus*) is a widely cultivated plant of family, Cucurbitaceae. Generally all the plant from Cucurbitaceae family viz cucumiform fruits that are used as vegetables or Fruits. The cucumber is a member of the Cucurbitaceae family, along with squash and different kinds of melon. Cucumbers are high in water and low in calories, fat, cholesterol, and sodium. There are three main varieties of cucumber: slicing, pickling, and seedless. Within these varieties, several cultivars have been created. Plants are used medicinally in different countries and are source of potent and powerful drugs (1). Over the centuries, the use of medicinal herbs has become an important part of daily life despite the progress in modern medical and pharmaceutical research (2). A wide range of medicinal plant parts are used as raw drugs as they possess varied medicinal properties thus herbal drugs constitute a major part in all traditional systems of medicines.



**Fig. 1 Cucumber a Fruit or Vegetable**



**Fig. 2 Cucumber a Fruit or Vegetable**

Plants above all other agents have been used for medicine from time immemorial because they have fitted the immediate personal need are easily accessible and inexpensive (3). Most plant used in treatment of digestion, diarrhea, constipation, toothache, flu, hepatitis, skin infection, diabetics. (4)

## **B. PLANT DESCRIPTION**

Cucurbitaceae is a plant family, also known as gourd family, which includes crops like cucumbers, squashes, luffas and melons. Cucurbits form an important and a big group of vegetables crops cultivated extensively in the subtropical and tropics countries. The family consists of about 118 genera and 825 species (5). Plants of this family have many medicinal and nutritional benefits (6). Cucumber is one of the monoecious annual crops in the Cucurbitaceae family that has been cultivated by man for over 3, 000 years (7, 8). With respect to economic importance, it ranks fourth after tomatoes, cabbage and onion in most of Asian countries (9). The phytochemical analysis of the plant show the presence of various chemical constituents like tannins, cardiac glycosides, terpenoids, carbohydrates, resins, saponins and phytosterols. While other phytochemical like alkaloids, flavonoids, glycosides, steroidal terpenes and phylobatamins were found to be absent in all the extracts (14).

## **C. Pharmacological activities of Cucumber.**

A profusion of research has focused on sustainable botanical ingredients as components in nutraceuticals and Cosmeceuticals. However, currently there is renewed interest in ethnobotany, and in researching through clinical trials the scientific basis behind cultural and indigenous uses of plants for medicinal uses. The results of these trials have many times stimulated new avenues in research on plants, vegetables and fruit ingredients and their possible uses within topical or supplement products. Along those lines, cucumber folk medicine includes treatment of diarrhea, gonorrhoea, diabetes, hypertension and it has been used to detoxify, as an anti-inflammatory, serum lipids regulator, antioxidant, and analgesic. While some of these uses remain unproven, there is accumulating research confirming cucumber's phytochemicals as potential chemopreventive and anticancer agents. Cellular dehydration, aging, damage and deterioration are human inevitabilities. Much scientific research has been devoted to decoding cellular processes to unlock methods that would halt, stave off or even transform natural, chronological aging. Indeed, some of the most exciting clinical findings on

phytochemicals have produced new knowledge on how to address old problems, such as with botanicals and photo-aging reactive oxygen species, or with cardiovascular disease and cancer.

## 1. Cucumber as Nutrients.

Cucumber contains thiamin, riboflavin, niacin, vitamin B-6, and vitamin A. One cup of cucumber provides around 11 percent of the daily allowance for vitamin K. Cucumbers also contain lignans.



Fig. 3 Cucumber as Nutrients

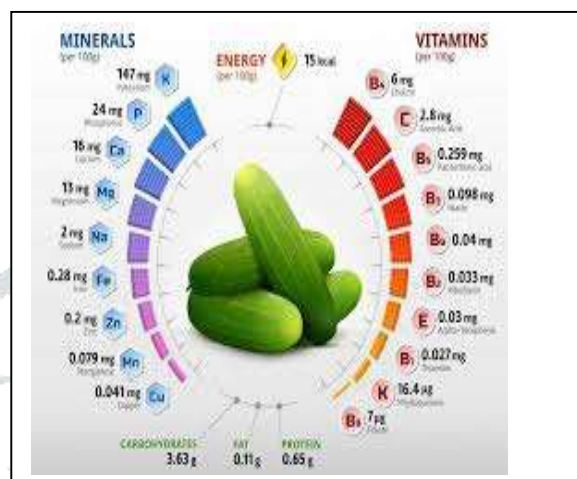


Fig. 4 Cucumber Nutritional Value

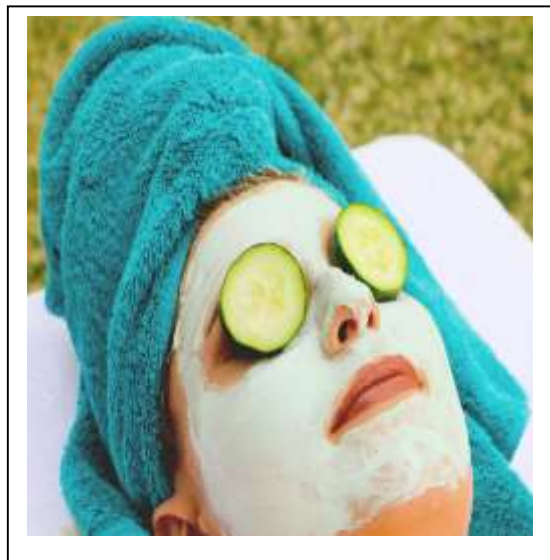
1 cup of raw sliced cucumber with peel, weighing around 52 grams (g) contains: of water, 8 calories, 0.34 g of protein, 0.06 g of fat, 1.89 g of carbohydrate, including 0.9 g of fiber and 0.87 g of sugar, 8 milligrams (mg) of calcium, 0.15 mg of iron, 7 mg of magnesium, 12 mg of phosphorus, 76 mg of potassium, 1 mg of sodium, 1.5 mg of vitamin C, 4 micrograms (mcg) of folate. Among the different cucumber varieties, highest moisture content was seen in English, Zucchini and Pranic healed cucumbers and the lowest moisture content was found in Holenarasipur and Dotted variety. Zucchini had the highest vitamin C, antioxidant activity, total phenolic. It was observed that Pranic treated samples showed better stability at room temperature and refrigerated storage (15).

## 2. Cucumber-Antimicrobial Activity

Cucumber possesses poor activity against *Pseudomonas Aeruginosa* only (10). The cucumber possesses the antimicrobial activity against human pathogenic microorganisms used except *E. coli* and that the aqueous leaf extracts affected only three of the human pathogens (*S. aureus*, *P. aeruginosa* and *S. typhi*) (11). Research reports of various scholars say that antimicrobial activity of seeds extract of five plants of Cucurbitaceae family *Karella*, *Cucumber*, *Tinda*, *Kaddu*, *loki* revealed that all the seeds extracts were very effective against *Serratiamarcescens*, *E. coli*, *Streptococcus thermophilus*, *Fusariumoxysporium*, *Trichoderma reesei* while some extracts showed no inhibition against *Aspergillus niger*, *Candida Albicans*. (12) Antifungal potentials of the ethanol extract of *Cucumis sativus* Linn. (30 µg/disc) were assessed against six fungus and (diameter of zone of inhibition) were compared with the activity of the standard drug, *Griseofulvin* (30 µg/disc). At 80 µg/disc, the ethanol extracts of *Cucumis sativus* Linn. (13)

### 3. Cucumber –A Cosmetic and Beautifier

Cucumbers do not only help to improve the body's health they can beautify as well. For centuries, women all over the world have used cucumber slices topically on their eyes to reduce signs of puffiness and dark shadows. It is also good for the skin in a toner, as it can soothe down irritation, redness and inflammation associated with summertime woes like sun burns and insect bites! Its high mineral content will also strengthen and beautify nails and hair if it is consumed on a regular basis.



**Fig. 5 Cucumber as Cleansing agent**



**Fig. 6 Cucumber face Wash**

In short, it is one of the best natural beauty treatments around. The antioxidants and silica present in cucumber help to lighten the dark skin and rejuvenate tired, dull looking skin. So, before you head for that under-eye cream the next time, give cucumber a shot Puffy eyes never make for a pretty sight. In fact, they can make you look tired and older than your age. Late night outings, long hours of staring at your computer, allergies, high salt intake or even stress can cause your eyes to puff up. One easy way to battle them comprises of the use of cucumber slices. Cucumber makes for an excellent skin toner as well. Just mix it with a few drops of lemon, honey, or aloe Vera and apply on your skin. It will help open pores, leaving your skin supple and radiant. It is reported that regular intake of cucumber fruit promotes healthy hair growth. It is useful in skin problems, sunburn and also for curing swelling under the eye. Its juice is also efficient to soften the skin texture. Placing the two slice of cucumber on eyes for 10 minutes can decrease the inflammation significantly. It is also beneficial for curing skin infection like eczema. In sun stroke piece of cucumber are placed on the head so that the patient may breathe moistened air in order to neutralize heat of his body. Fruit is also considered important for weight loss. Traditionally seed were used to expel the intestinal worms and tapeworms. The remedy is carried out when mashed seeds mixed with sugar that should be taken before any meal. Leaves are boiled and mixed with cumin seeds, roasted and powdered, are administrated in throat infections in the doses of 30 grams or more (20)

#### 4. Cucumber for Pregnant Women

Although cucumbers have their cons when it comes to pregnancy, here's a list of popular health benefits that may make you consider adding a small number of cucumbers in your pregnancy diet, especially if you're craving them.



- (A) **Enhances Skin Elasticity:** If you're in your first trimester of pregnancy, we recommend adding a bit of cucumber to up your collagen intake and boost skin elasticity for your already-widening bump.
- (B) **Prevents Swelling:** Cucumbers are a natural diuretic and eliminate swelling in the body by urination during pregnancy.
- (C) **Foetal Development:** Let's not forget facts. Cucumbers come with Vitamin C, B1, B2, B3, folic acid, zinc, potassium, magnesium, and iron, all of which are essential for fetal development, thus, preventing growth abnormalities in pregnancy and Delivery after birth.
- (D) **Bye-Bye Constipation:** Cucumbers have high fibre content. That means, no more constipation or bouts of haemorrhoids during your pregnancy.
- (E) **Boosts Immunity:** Rich in vital antioxidants, cucumbers boost your immunity and prevent infections during pregnancy and after delivery.
- (F) **Cucumber has various sexual benefits.** It helps to promote the level of testosterone in men. This is one of the main hormones in men that regulate sexual activities. Consuming cucumber helps in erection and hence improves sexual performance. Testosterone is also required for building muscles and bringing up a masculine figure.

#### 5. Cucumber-Antioxidant Activity

The fruit extracts of yellow cucumber possess more antioxidant activity where it is not usually included in fruit salad but mostly used in Sambar, while green and white cucumbers are included in



**Fig. 7 Cucumber as Antioxidants**



**Fig. 8 Medicinal uses of Cucumber**

salads and eaten raw, by this investigation they suggested to use yellow cucumber in salads where it supply us with valuable antioxidants. It is well known that free radicals are one of the causes of several diseases. The result from in vitro antioxidant assays showed that three varieties of cucumber contain the significant antioxidant activity. The activity may be due to the presence of carotenoids, phenolic flavonoids, tannins, polyphenols and lycopene, found in it (22).

## 6. Cucumber-Cytotoxic Activity

As a member of the Cucurbitaceae family of plants, cucumbers contain high levels of nutrients known as cucurbitacins, which may help prevent cancer by stopping cancer cells from proliferating and surviving. Cucumbers contain cucurbitacins A, B, C, D, and E. There are currently no current anti-cancer therapies that utilize cucurbitacins. The cytotoxic activity of the ethanolic extracts of *Cucumis sativus*. In brine shrimp lethality bioassay, the ethanol extract showed lethality against the brine shrimp nauplii. It showed different mortality rate at different concentrations. From the plot of percent mortality versus log concentration on the graph paper, LC50 ( $\mu\text{g/ml}$ ) and LC90 ( $\mu\text{g/ml}$ ) of the ethanol extract of *Cucumis sativus* Linn. Were concluded respectively. (23) Cucumber contains lariciresinol, pinoresinol, and secoisolariciresinol 3 lignans that have a strong history of research in connection with reduced risk of several cancer types, including breast cancer, prostate cancer, uterine cancer, and ovarian cancer.

## 7. Cucumber- Antacid & Carminative Activity

The aqueous extract fruit pulp of *C. sativa* significantly neutralized acid and showed resistance against change in pH and also illustrate good carminative potential. The extract of *C. sativa*, has shown to possess significant carminative and antacid property. (24)

## 8. Cucumber-Activity against Ulcerative Colitis

The aqueous extract of *Cucumis sativa* Linn. Fruit in ulcerative colitis in laboratory animals. In this study, the aqueous extract of *Curcumis sativa* L. selected for screening against experimentally induced bowel disease. The extract of *C. sativa*, has shown to possess significant property against ulcerative colitis. (25)

## 9. Cucumber-Hepatoprotective Activity

The effect of Cucumis sativa against cumene hydro peroxide induced- oxidative stress. They concluded that aqueous extract of Cucumis sativus acts as a Hepeto-protective and antioxidant agent against CHP-induced hepatotoxicity suggesting that antioxidants and radical scavenging components of Cucumis sativus fruit extract can easily cross the cell membrane and cope with the intracellular ROS formation. (26)

## 10.Cucumber-Hypoglycemic and Hypolipidemic Activity

It is investigated that cucumbers may help control and prevents diabetes. Cucumbers, like squash, gourd, melon, and other related foods, contain Cucurbita ficifolia, which may help reduce spikes in blood sugar. One theory is that the cucurbittans in cucumber stimulate insulin release and regulate the metabolism of a key hormone in the processing of blood sugar, hepatic glycogen. They also have a low score on the glycemic index, which means they provide important nutrients without adding carbohydrates that can increase blood glucose. It is investigated that the Hypoglycemic and Hypolipidemic Effects of Cucumber in Alloxan Induced Diabetic Rats. It was concluded that the ethanol extracts of Cucurbitaceae family fruits, cucumber, white pumpkin and ridge gourd has significant anti hyperglycemic effects. They also have the capability to lessen the high lipid profiles. Ridge gourd has also significant effects to regain the depressed hepatic glycogen levels. Therefore, we believe that these fruits extracts can be useful, at least as an adjunct, in the therapy of diabetes, a condition in which hyperglycemia and hyperlipidemia coexist quite often (27). This veggie contains a hormone needed by the cells of the pancreas for producing insulin. Researchers found that some compound called sterols in cucumber may help reduce cholesterol levels. Cucumber contains Si and S and thus a regular intake of cucumber can help promote healthy hair growth. For best results, mix cucumber juice with the juices of carrot, lettuce or spinach.

## 11.Cucumber- Wound Healing Activity

The research scholar was studied on pharmacological evaluation of wound healing potential of Cucumis sativus. They concluded that aqueous extracts of Cucumis sativus have good effectiveness on wound healing. Herbal paste preparation showed significant ( $P<0.05$ ) enhancement on maturation, wound contraction and epithelialisation (28).

## 12.Cucumber-Electrolytes Replenishes

There are many ways in which cucumbers promote the general health of the body. Firstly, because cucumbers are mostly water, they are able to help the body stay hydrated, which is one of the most important things that anyone can do for their own health. Compounds in the cucumber have been shown to help lower blood pressure, which also lowers the risk of many serious complications like heart disease, kidney and eye problems and strokes. And because of their high vitamin and mineral content, they can also help avoid nutrient deficiencies and keep the body functioning at its best.

Consisting mostly of water, and containing important electrolytes, cucumbers can help prevent dehydration during the hot summer months like April, May or during and after a workout. Adding cucumber and mint to water can increase water consumption by making it more attractive to drink. Dehydration is important for many

things including maintaining a healthy intestine, preventing constipation, and avoiding kidney stones. Cucumbers have mild diuretic property, which perhaps attributed to their free-water, and K and low Na content. This helps in checking weight gain and high blood pressure. The water content of cucumber acts as a diuretic. It encourages the elimination of waste products from the body through urination. Regular intake of cucumber helps to dissolve bladder or kidney stones. Due to its low calorie and high water content, cucumber is an ideal diet for people who looking for weight loss.



**Fig. 9 Cucumber as Electrolyte**



**Fig. 10 Cucumber as Diuretics**

### 13. Cucumber-In Bone health formation

A sufficient intake of vitamin K has been associated with healthy bones that are less likely to fracture. One cup of cucumber provides 8.5 micrograms (mcg) of vitamin K. The Office of Dietary Supplements recommends that women aged 19 years and over consume 90 mcg of vitamin K each day, and men 120 mcg. It also contains calcium. Vitamin K helps improve calcium absorption. Together, these nutrients donate to good bone health. They surprisingly have a high amount of vitamin K, provides ~ 17 µg of this vitamin/ 100 g. Vitamin-K has been found to have a potential role in bone strength by promoting osteotropic activity.

### 14. Cucumber –In Cardiovascular health

In American and European Counties people eat more fiber, as this can help prevent a buildup of cholesterol and the cardiovascular problems that can result from this. Cucumbers are good sources of fiber, particularly in the skin. They also provide potassium and magnesium. The American Health Association also recommends reducing sodium and increasing potassium intake to help prevent high blood pressure. The cucurbitacins in cucumber may also help prevent atherosclerosis.

### 15. Cucumber-Analgesic and Anti-inflammatory agent

Cucumbers are believed to have anti-inflammatory benefits. Used directly on the skin, sliced cucumber has a cooling and soothing effect that decreases swelling, irritation, and inflammation. It can alleviate sunburn. Placed



on the eyes, they can help decrease morning puffiness. Cucumber is an excellent source of silica which is known to help promotes joint health by strengthening the connective tissues. Cucumber is a best ingredient for gout pain relief. When mixed with carrot juice, they can relieve gout and arthritis pain by lowering the uric acid levels.

## 16.Cucumber- In weight loss

There are many ways in which cucumbers help aid weight loss. To begin with, they are low in calories but high in fiber, so eating them can help curb the appetite naturally and make it easier to cut down on food intake without being plagued by hunger pains. Cucumbers also improve digestion because of their high fiber content, and good digestion has been linked in numerous studies to easier weight loss. Lastly, it also detoxifies the body, which boosts energy levels and makes it easier to be active, which is helpful if someone is trying to achieve their weight loss goals.



**Fig. 11 Cucumber reduces weight loss**



**Fig. 12 Cucumber reduces weight loss**

## D. CONCLUSION

Cucumbers are literally one of the most versatile fruits as it can be used topically, internally and also for mood stability when modulating stress. Early research shows that its phytochemicals may provide cancer drug-enhancing activity while it staves off cardiovascular disease. In addition to its soothing properties and digestive benefits, cucumbers fortify cells so they may retain hydrated and work at the highest levels, and may slow age-related cellular deteriorations. Because of its known therapeutic value, more study on cucumber is warranted, which will likely open even more scientific avenues of study and discussion. Cucumber (*C. sativus*) fruit is a source of the secondary metabolites, that is, alkaloids, flavonoids, Terpenoids, Tannins, Saponins, steroids, phenols, glycosides, reducing sugars, etc. Cucumber fruit may play vital role in preventing various diseases such as inflammation, bacterial infection, lipid peroxidation, fever, constipation, etc. The anti-inflammatory, anti-bacterial, antioxidant, analgesic and anti-constipation may be due to the presence of the above mentioned phytochemicals especially flavonoid, alkaloids and proximate constituents. Thus, it is expected that the important phytochemical properties and proximate compositions identified in this study in the homogenate of cucumber fruit will be helpful in the coping of different diseases. *Cucumis sativus* exhibited strong activities against a wide range of parameter which means that it contains compounds which have broad spectrum of activity.

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