

International Journal of Technical Research & Science
A REVIEW ON CUCUMBER
(Cucumis Sativus)

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Abstract-Plants are basic source of food and energy. Cucumber which is consumed in different ways like sweet, vegetable and salads. Cucumber (**Cucumis sativus**) belongs to curcubataceae family possess antibacterial, antimicrobial, antifungal characteristics and showed activities like antioxidant, phytochemical and hypoglycaemic activity. Its also used as traditional remedies Different genotype of plant showed different yield.The present article attempts to provide comprehensive information on pharmacological significance of **Cucumis sativus** for further research. All the information's were collect from the published research paper on **Cucumis sativus** as for the sake of future research on it.

Key Words: Cucumber, cucurbitaceae, remedies, pharmacological, genotype & yield

1. INTRODUCTION

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 posses varied medicinal properties thus herbal drugs constitute a major part in all traditional systems of medicines. 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, diaherea, constipation, toothache, flu, hepatitis, skin infection, diabetics. (4)

2. 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 (*Cucumis sativa* L) 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 Asia (9).

2.1 Antimicrobial Activity

D. A. Khan et al reports that *Cucumis sativus* possess poor activity against *Pseudomonas aeruginosa* only (10). **G. G. E. Osuagwu et al** reports that ethanolic extracts of leaf of *M. charantia*, *L. cylindrical* and *T.cucumerina* have antimicrobial activity on the test 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) . **A. Sood et al** reports that antimicrobial activity of seeds extract of five plants of Cucurbitaceae family- *Momordica charantia* (Karella), *Cucumis sativa* (Cucumber), *Praecitrullus fistulosus* (Tinda), *Cucurbita pepo* (Kaddu), *Lagenariasiceraria* (loki) revealed that all the seeds extracts were very effective against *Serratiamarcescens* , *E. coli*, *Streptococcus thermophilous*, *Fusariumoxysporium*, *Trichodermareesei* while some extracts showed no inhibition against *Aspergillusniger* (*Cucumis sativa*), *Candida albicans* (*Praecitrullusfistulosus*, *Cucurbitapepo*, *Lagenariasiceraria*) (12).

Jony Mallik et al reports that antifungal potentials of the ethanol extract of *Cucumis sativus* Linn.(30µg/disc) were assessed against six fungus and (diameter of zone of inhibition) were compared with the activity of the standard drug, Griseofulvin (30µg/disc). At 80µg/disc, the ethanol extracts of *Cucumis sativus* Linn. (13)

2.2 Phytochemical Analysis

A. Sood et al reports that phytochemical analysis of the plant confirm thepresence of various phytochemicals like tannins, cardiac glycosides, terpenoides, 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).

2.3 Nutritional Composition

A. Urooj et al reports that 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 phenolics and °Brix. It was observed that Pranic treated samples showed better stability at room temperature and refrigerated storage (15).

2.4 Genotype

A.R Eghtedary et al reports on twenty genotypes of cucumber (*Cucumis sativus*) that were collected from different geographical regions. Analysis of variance showed that there was a high significant variation for all of the studied traits between genotypes. Mean comparison showed that the genotypes showed a broad phenotypic variation for studied traits, such that total fruit yield per pickling ranged from 474.3 g (Gohar) to 338.3 g (Tornado). Cluster analysis with Ward method divided the genotypes to four distinct groups. Genotypes in group number two (Gohar, Adrian451, Green majic, Sina) had the highest total fruit yield per pickling. For other traits, genotypes in groups number 1 and 2 (10 genotypes) showed best situation. Therefore, Selection of superior genotypes in view point of desirable morphologic traits, with high genetic distance could be selected for hybridization programs and recognition of best genotypes for different traits to produce new elite hybrids in cucumber (16).

Z. Khan report on 24 genotypes of cucumber to find out their resemblance and variation based on numerical traits. The experiment was design in Randomized Complete Block Design (RBCD) with two replications. Numerical traits of the genotypes were calculated according to the coding criteria specified by European Cooperative Programmed for Plant Genetics Resources (ECPGR) 2008. Data showed great variation for almost all the traits. Maximum germination (67.5%) was observed in genotype Mardan local while minimum germination (17.5%) was recorded in genotype 28295. The genotypes Haripur local and 28293 showed early flowering. Similarly highest yield was observed in USA Poinsett, Dargai local and Mardan local. These genotypes could be chosen for crossing with other genotypes like 28295 and Sialkot selection having low germination rate and low yield to get a better genotype of cucumber with high germination and maximum yield. Correlation analysis represent that yield was positively correlated with fruit length (.523** P<0.01) and fruit width (.439* P<0.01). While fruit per plant showed positive significant correlation with vine length (17).

2.5 Yield

A. Nair et al reports that trellising cucumbers in high tunnel production systems yield higher number of marketable fruits compared with non-trellised systems. Growers should consider trellising their cucumber plants especially when growing them in high tunnels. Trellising permits for enhanced air movement and heat dissipation and decrease incident of fungal and bacterial infection. While white plastic mulch reflected twofold the amount of light when evaluated with black mulch, it did not translate to enhanced yield or productivity. White plastic mulch kept the soil cooler than black and could be used in high tunnel production when crop plantings occur during peak summer (18).

E.C. Enujeke carried out study to evaluate the growth and yield responses of cucumber to five different rates of poultry manure in Asaba area of Delta State, Nigeria. It was perform in a Randomized Complete Block Design (RCBD) with three replicates. Rates of poultry manure in tons per hectare were 0, 5, 10, 15, and 20. The parameters measured to attained the objectives of the investigation were vine length, number of leaves/plant, fruit diameter, fruit length, and fruit weight of cucumber. They concluded that plants that received 20tha⁻¹ of poultry manure were better in the parameters tested. Based on the result of the study, it was recommended that farmers in the study area apply 20tha⁻¹ of poultry manure for increased growth and yield of cucumber (19).

2.6 Medicinal Uses

Dr. A. Shrivastava et al 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 administered in throat infections in the doses of 30 grams or more (20).

Kashif et al reported that due to elevated content of potassium (50-80 mg/100g), cucumber can significantly be helpful for both high and low blood pressures (21).

2.7 Antioxidant Activity

L. Kumaraswamy demonstrated that 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 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).

2.8 Cytotoxic Activity

JonyMallik et al were carried out an study on 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)

2.9 Antacid & Carminative Activity

Swapnil Sharma et al was studied with 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)

2.10 Activity Against Ulcerative Colitis

Patil et al was depicted following an authentic investigation with the aqueous extract of *Cucumis sativus* Linn. fruit in ulcerative colitis in laboratory animals. In this study, the aqueous extract of *C. sativus* L. selected for screening against experimentally induced boweldisease. The extract of *C. sativa*, has shown to possess significant property against ulcerative colitis. (25)

2.11 Hepatoprotective Activity

H. Heidari et al was investigated the effect of *Cucumis sativus* against cumenehydroperoxide induced-oxidative stress. They concluded that aqueous extract of *Cucumis sativus* acts as a hepatoprotective 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)

2.12 Hypoglycemic and Hypolipidemic Activity

R. Sharmin et al were investigated 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 in AIDRs. They also have the capability to lessen the high lipid profiles in AIDRs. Ridge gourd has also significant effects to regain the depressed hepatic glycogen levels in AIDRs. 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).

2.12 Wound Healing Activity

Patil et al were 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).

2.13 Copper Effect

Salicylic acid (SA) is a growth regulator that enhances growth of plants under stress and non-stress conditions. SONGÜL et al studied the role of salicylic acid in copper induced physiological and biochemical changes and the possible induction of oxidative stress in detached cucumber cotyledons. They concluded that fresh weight accumulation and the photosynthetic pigment content were decreased and the levels of some important parameters regarding oxidative stress in the cotyledons, namely lipid peroxidation (MDA), glutathione (GSH) and proline were increased (29).

CONCLUSION

Cucumis sativus exhibited strong activities against a wide range of parameter which means that it contains compounds which have broad spectrum of activity.

ACKNOWLEDGEMENT

Authors are thankful to acknowledge all authors and their work included in review.

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