

A REVIEW ON ANTIHYPERTENSIVE PROPERTIES OF RAPHANUS SATIVUS, DAUCUS CAROTA AND TRIBULUS TERRESTRIS

Loveneet Kaur¹

¹Department of Botany, Mata Gujri College (Autonomous), Fatehgarh Sahib, Punjab (India)

E mail: lovneet.bhangu@gmail.com

Abstract

Vegetables are an important part of human diet in all over the world. Many studies favour the effectiveness of vegetables for the prevention of hypertension (high blood pressure). The nutrients present in vegetables acts as anti- oxidants and help to prevent hypertension. They lower down the blood pressure that successively solves the problem of hypertension. This review paper focuses on effective role of Radish, Carrot and Bindii in the prevention of hypertension.

Key words: Bindii, Blood pressure, Carrot, Hypertension, Radish, Vegetables.

Introduction

Hypertension is the most common disease in the world [1]. Hypertension contributes a large part in death in the world as it is a major risk factor for renal disease, cardiovascular disease and other morbidities [2, 3]. Change in diet can reduce the blood pressure (BP), prevent the beginning of hypertension, and lower down the risk of hypertension that is related clinical complications [4]. If the diets are based on vegetable, have lower the level of blood pressure and reduce the incidence of hypertension as compared to normal diet [5]. Small feeding trials were made by changing an omnivorous to a vegetarian diet that showed reduction in blood pressure in patient with hypertension [6] with unchanged body weight.

This works provides the information about efficient role of vegetables in prevention and treatment of hypertension. In this paper role of three vegetables; Radish, Carrot and Bindii in prevention and treatment of hypertension has been discussed in detail.

The potassium present in radish help in lowering of blood pressure. The presence of potassium in carrots can lower blood pressure [7]. Aqueous extract of bhindii may have some antihypertensive effects.

Radish (*Raphanus sativus* L.)

Kingdom –Plantae

Order- Brassicales

Family- Brassicaceae

Genus - Raphanus

Species- *R. sativus* L.

ROLE OF RADISH IN PREVENTION OF HYPERTENSION:

Raphanus sativus, a herbaceous annual or biennial plant belonging to the Brassicaceae family and is cultivated for its tasty tap root. The radish plant has a short, hairy stem and a rosette of oblong-shaped, ground-level leaves that range in length from 5 to 30 cm. Racemes of numerous purple or pink flowers are produced by the radish plant, and each raceme contains 2–12 seeds [8]. Typically, radish plants only last one growing season and are annuals [9]. The radish root can be cooked with other foods, including meat, or eaten raw in salads.



Fig. 1 Radish

Additionally, the radish has anti-hypertensive properties [10, 11, 12, 13]. Radish is rich in potassium and helps in decreasing blood pressure especially if a person is suffering from hypertension, and keep control of blood pressure and blood flow. The extract reduced blood pressure and heart rate in a dose-dependent (0.1-3 mg/kg) manner [14]. Mainly the leaves of Radish have antihypertensive properties[14,15].

Carrot (*Daucus carota* L.)

Kingdom –Plantae

Order- Apiales

Family- Apiaceae

Genus - *Daucus*

Species- *D. carota* L.

An edible taproot is produced by the herbaceous, mostly biennial carrot plant. The morphologies of popular types' roots range from spherical to lengthy, with lower ends that are either blunt or pointy. There are also documented white, yellow, and purple fleshed variations in addition to the orange-colored roots. [16]



Fig. 2 Carrot

According to Gopalan et al. (1991), carrots contain 86 percent moisture, 0.9 percent protein, 0.2 percent fat, 10.6 percent carbohydrate, 1.2 percent crude fibre, 1.1 percent total ash, 80 mg of calcium per 100 grams, 2.2 mg of iron per 100 grams, and 53 mg of phosphorus per 100 grams. However, the values reported by Holland et al. (1991) for the majority of these parameters are different. (17).

ROLE OF CARROT IN PREVENTION OF HYPERTENSION:

Traditional medicine has included carrot as a mediator for treating hypertension. Carrot has antihypertensive properties [12, 13, 16], enhances endothelial function and controls fluid balance. Antioxidants included in carrot juice reduce oxidative stress and regulate blood vessel function. Due to the presence of potassium, carrots can lower blood pressure [7, 18].

Bindii (*Tribulus terrestris* L.)

Kingdom –Plantae

Order- Zygophyllales

Family- Zygophyllaceae

Genus - Tribulus

Species- *T. terrestris* L.

Tribulus terrestris L., commonly known as "Gokhru" in hindi and "Bhakhra" in punjabi, belongs to the Zygophyllaceae family. It grows as a wild plant in subtropical regions and is widely distributed all around India. Its fruits have been used to treat several conditions in traditional Chinese medicine issues with the eyes, oedema, the abdomen, emission, morbid leucorrhoea, sexual dysfunction, and veiling. Roots and fruits can help with piles, renal, venous, and arthritic conditions, calcifications, menorrhagia, impotence, early sex, overall lassitude, etc. A figure 3 illustrates the leaves and flowers of the plant. It works as a powerful diuretic and a tonic drug. However, its leaves are used as a vegetable and are having high medicinal value [19].



Fig. 3 Bindii (*Tribulus terrestris*)

Its many parts contain a range of chemical elements that are crucial for medicine, including alkaloids, steroidal saponins, flavonoids, and flavanol glycosides. The steroidal saponins have received the greatest research [20].

Young sections of it are silky-villous, and its stems and branches are pilose. From the crown, stems branch out to diameters ranging from 10 cm to over 1 m. The leaves are abruptly pinnate, opposite, and pointed. Leaflets are 5-8 in pairs and range in length from 0.5 to 1.3 cm. They are subequal, oblong to linear oblong, mucronate, and have small, pilose petiolules. It has effective anti-hypertensive properties [21]. The methanolic and aqueous extracts (0.3–15 mg/ml) of bindii shows vasodilatory properties [22, 23]. It is a Mediterranean fruit-producing shrub with spines all around it. Its alternate name is pierce vine. The Tribulus plant's fruit, leaves, or roots are used by people as medicines. Other substances may also be present in some formulations [24].

ROLE OF TRIBULUS TERRESTRIS IN PREVENTION OF HYPERTENSION:

With no significant adverse effects, *Tribulus terrestris* has been used for years as a herbal remedy to manage hypertension. It is used to treat hypertension [25]. Aqueous extract from Tribulus fruits may have some antihypertensive effects, albeit the mechanism is uncertain, according to earlier reports. In South Africa, the herb is utilised as a rheumatism treatment [21]. It is a popular sexual stimulant for both men and women in Ayurvedic medicine [26].

In an animal study, Sharifi et al. reported that 10 mg/kg/day of the *T. terrestris* fruit's aqueous extract had antihypertensive effects [27]. According to Cai et al., a clinical trial shows that a saponin from *T. terrestris* can widen coronary arteries and enhance coronary circulation, making it useful for treatment for angina pectoris. Chinese medicine known as "Xinnao Shutong" is prepared from the crude saponins of Chinese *T. terrestris* and is effective in treating brain disorders, coronary illness, and myocardial infarction [28]. To investigate the underlying mechanism in rats, Zhang et al. assessed the preventive effect of tribulosin from *T. terrestris* against cardiac ischemia/reperfusion injury. Through the activation of protein kinase C epsilon, tribulosin shielded the myocardium from

ischemia/reperfusion injury [29]. Following a cardiac attack, *T.terrestris* may even increase heart function since it appears to protect heart cells [30].

Conclusion

This review shows the potential of vegetables; *Raphanus sativus*, *Daucus carota* and *Tribulus terrestris* for treatment of hypertension. A chain of evidences are collected to perform this review. All these evidences favour the effectiveness of these vegetables for the treatment of hypertension. The consumption of these vegetables lowers the blood pressure and reduces hypertension. In future, more research is required to find more aspects about it.

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