
Ghaidaa Jihadi Mohammed¹, Imad Hadi Hameed²
¹Department of Biology, College of Science, University of Al-Qadisiyah, Hillah city, Iraq; ²Biomedical Science Department, University of Babylon, College of Nursing, Hillah city, Iraq

ABSTRACT

The radish (Raphanus raphanistrum subsp. sativus) is an edible root vegetable of the Brassicaceae family that was domesticated in Europe in pre-Roman times. The root is best harvested before the plant flowers. Its use is not recommended if the stomach or intestines are inflamed. The leaves, seeds and old roots are used in the treatment of asthma and other chest complaints. The juice of the fresh leaves is diuretic and laxative. The seed is carminative, diuretic, expectorant, laxative and stomachic. It is taken internally in the treatment of abdominal bloating, wind, acid regurgitation, diarrhea and bronchitis. The root is antiscorbutic, antispasmodic, astringent, cholagogue, and diuretic. Antimicrobial proteins and peptides in plants have most commonly been discovered in seeds where they accumulate to high level and may also function as storage proteins. The crude water extract of seed inhibited moderate antifungal activity while showed highest antibacterial activity against Hafnia alvei and Enterobacter agglomerans exhibited. It has been observed that rude water extract posses highest antibacterial activity. Crude water extract showed significant inhibition against some fungal strain like Spadicoides stoveri and Paecilomyces variotii while some fungal strain having insignificant inhibition.

Keyword: Hepatoprotective, Anti-cancer, anti-microbial, Raphanus raphanistrum, Review.

INTRODUCTION

Radishes are grown and consumed throughout the world, being mostly eaten raw as a crunchy salad vegetable. Radishes have long been grown as a food crop, but they also have various medicinal actions. The plant is used in the treatment of intestinal parasites, though the part of the plant used is not specified. They have numerous varieties, varying in size, flavor, color, and length of time they take to mature. Radishes owe their sharp flavor to the various chemical compounds produced by the plants, including glucosinolate, myrosinase, and isothiocyanate. They are sometimes grown as companion plants and suffer from few pests and diseases. It is crushed and used as a poultice for burns, bruises and smelly feet. Radishes are also an excellent food remedy for stone, gravel and scurburitic conditions. The plant contains raphanin, which is antibacterial and antifungal. It inhibits the growth of Staphylococcus aureus, E. coli, streptococci, Pneumococci etc. Radish preparations are useful in liver and gall bladder troubles. Consuming radish generally results in improved digestion, but some people are sensitive to its acridity and robust action. The plant also shows anti-tumor activity.

PHARMACOLOGICAL ACTIVITIES

Hepatoprotective activity: It is reported that the methonolic extract of leaves of Raphanus sativus active against paracetamol induced hepato toxicity. Paracetamol increased the activity of hepatic enzymes like SGOT, SGPT, serum LDH, serum AP. An antioxidant is a molecule capable of slowing or preventing the oxidation of other molecules. Oxidation reactions can produce...
free radicals, which start chain reactions that damage cells\textsuperscript{32-36}. Antioxidant defenses fall in to two main categories, those whose role is to prevent the generation of free radicals and those that intercept any radicals that are generated.

**Cardio protective activity:** The chronic cardio toxicity may result from summation of multiple biochemical pathways of cellular damage, which ultimately yields disruption of myocardioocyte integrity and loss of cardiac function. Nitric oxide (NO) is a key molecule involved in the pathophysiology of heart; disregulation of activity of nitric oxide synthases (NOSs) and of NO metabolism seems to be a common feature in cardiac diseases\textsuperscript{37-41}. Hence uric acid may serves as an additional marker of free radical reactions in patients with acute myocardial infarction and acute coronary insufficiency.

**Anti-cancer and anti-microbial activity:** Anti-cancer and anti-microbial activity of methanolic extract of leaves of *Raphanus sativus* was reported. Insoluble ethyl acetate fraction from methanol extract was the most active against *A. salina*. On the other hand, the soluble ethyl acetate fraction from methanol extract exhibited strong inhibitory activity against *S. aureus*.

**Anti-microbial activity:** The plant contains raphanin, which is antibacterial and antifungal\textsuperscript{15}. It also has been found to be strongly active *Escherichia coli, Pseudomonas pyocyaneus, Salmonella typhi* and *Micrococcus subtilis*\textsuperscript{42-48}. It inhibits the growth of *Staphylococcus aureus, streptococci, Pneumococci*. It is also active against many food born pathogenic and food spoilage bacteria such as *Listeria, Micrococcus, Enterococcus, Lactobacillus* and *Pedicoccus* spp.

**Inhibitory response on lipid peroxidation:** Free radicals are continuously produced in body of all living organisms mainly due to oxidation processes. Antioxidant system of the body is generally able to combat the oxidative stress produced after normal physiological processes. Modern civilization is facing a variety of mental and physical stress, pollutant stress, stress caused by consuming fast food, etc\textsuperscript{49-51}. These stresses culminate into generation of free radicals and the antioxidant system of body fails to combat this situation. Oxidation of lipid molecules of membrane causes its damage resulting into the development of several physiological and pathological disorders. Inhibition of lipid peroxidation by any means is the best way to avoid these disorders in the body. It was reported that the plant inhibits lipid peroxidation by increasing the activity of enzymatic antioxidants like catalase and also by increasing or maintaining the levels of glutathione.

**Antiurolithiatic activity:** The aqueous extract of the bark of *Raphanus sativus* was tested for its antiurolithiatic and diuretic activity. The urolithiasis was experimentally induced by implantation of zinc disc in the urinary bladder of rats. Significant decrease in the weight of stones was observed after treatment in animals which received aqueous extract in comparison with control groups.

**Anti tyrosinase and anti-oxidant activity:** Two different types of *R. sativus* L. root extracts, i.e., the freeze-dried juice and the methanolic extract were evaluated for their inhibitory effect on mushroom tyrosinase and their scavenging activity on DPPH, superoxide anion and singlet oxygen. The methanolic extract of the radish sprout exhibited hydroxyl radical scavenging potency 1.8-fold higher than that of L-ascorbic acid. It is suggested that flavonoids, together with sinapinic acid esters, may significantly contribute to the antioxidant activity of radish roots and sprouts. Also, black radish, which is a variety of *R. sativus*, possesses antioxidant and free radical scavenging properties\textsuperscript{52-54}. It is very likely that the Thai radish roots may possess significant antityrosinase and antioxidant activities which will have beneficial effects on the skin.

**Gastro protective activity:** The radish juice possesses an antigastric ulcer effect, being presumably attributed to its phenolic, terpenoidal and sulphurated constituents through preventing the accumulation of excessive free radicals and protecting the gastric tissue against noxious chemical challenges. This may be related to its PG generating, antioxidant and/or preserving mucus secreting properties and by strengthening the mucosal barrier integrity, which is the first line of defense against endogenous and exogenous ulcerogenic agents.

**CONCLUSION**

Plant medicinal properties of *Raphanus raphanistrum* is due to presence of bioactive chemical products. *Raphanus raphanistrum*, is widely used in the treatment of antiurolithiatic, diuretic activity, anti-cancer and anti-microbial activity.
Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: In our review, all these major pharmacological activity were complete analysis under the biological department of College of Science for Women in Hillah city.

REFERENCES


