

The Underutilised Vegetable Radish For Micronutrient Security

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Introduction: Radish (*Raphanus sativus*) is a root vegetable grown annual or biennial brassicaceous crop belonging to diploid species with 18 chromosomes that is consumed worldwide. It is a light-colored, crunchy tuber with spicy to peppery taste that varies from mild to very strong. They are short and round to long and narrow red, black, white, yellow, pink or purple skin color. It is likely to be native of the southeast or central Asia including winter and spring radishes based on the time of harvest. Spring radish has short growing season with smaller size, eaten raw generally and stored for shorter duration whereas winter radish has longer growing season with big round or elongated, are eaten cooked and stored for longer duration.

History of radish: About 2500 years, the ancient Greeks and Romans used it as food and medicine. The Greek-Arab and Indian folk medicine used it as a household remedy for treating ailments like jaundice, gallstones, liver diseases, rectal prolapse, indigestion and other gastric problems.

Cultivation of radish: Radish seed germinate in three to four days under moist conditions and soil temperatures of 18 to 29°C. The best quality roots are obtained under moderate day lengths with air temperatures in the range 10 to 18°C. The crop mature in 3 – 4 weeks under optimal conditions but in colder weather, they may take 6 – 7 weeks.

Radishes can be a companion plants for many other crops as they emit pungent odor that can deter insects and pests like aphids, cucumber beetles, tomato hornworms, squash bugs, and ants to a certain extent. They can be used as a trap crop luring insect pests away from the main crop to reduce their losses. Cucumbers and radishes can thrive well when grown in close association with each other along with chervil, lettuce, peas and nasturtiums.

Nutritional value of radish: Every 100 g radish provided 16.0 Kcal energy, 3.4 g carbohydrates, 0.7 g protein, 0.1g fat, 1.9 g sugars and of 1.6 g dietary fiber. They are low in calories as water content is 95.0% with water-soluble vitamins like B₁, B₂, B₃, B₅, B₆, B₉ and C. The consumption of 100.0g of radish provided RDI of 25.0% vitamin C, 6.0% folate, 2.5% calcium, 4.0% iron, 5.0% copper, 7.0% potassium, 5.0% vitamin B₆ and 2.0% magnesium.

Health benefits of radishes: The flower, fruit, leaves and seeds are used widely for their potent medicinal purposes in treating common every day ailments like fever, cold, cough and allergies. It contained unique bioactive compounds like catechin, pyrogallol, vanillic acid and other phenolic compounds that provide potential health benefits. Although radish is not a much-preferred vegetable can protect the heart to reduce indigestion, detoxify liver and stomach and make skin healthy with its abundant antioxidants. The vitamin C present in these roots acts as an antioxidant to protect your cells from damage.

Can reduce the risk for diabetes: It contains chemical compounds like glucosinolates and isothiocyanates that can help regulate blood sugar levels. The coenzyme Q10 is an antioxidant present in it that can help reduce the risk of diabetes.

Boosted liver and kidney function: The indole-3-carbinol and 4-methylthio-3butenyl-isothiocyanate present in these roots can help the liver detoxification and heal against damage. These same compounds also help the kidneys flush out toxins, acting as a diuretic due to the presence of minerals like potassium and magnesium that may increase urine production, help reduce inflammation and relieve the burning sensation during urination.

Benefits that regulate blood pressure: It provides the body with required potassium that can lower the blood pressure and control blood flow.

Protects heart: The anthocyanins present in it keep the heart functioning appropriately and reducing the risk of cardiovascular diseases. The natural nitrates can improve blood flow in the body.

Assistants in digestion and prevent piles: Radish is rich in dietary fiber that can lower gastric emptying time and improve bowel movement. The indigestible carbohydrates like lignins help decrease water retention thereby preventing constipation that otherwise can cause hemorrhoids or commonly called piles. This root is good for the digestive system as it can reduce acidity, obesity and nausea due to its ample mineral and water content.

Enhanced immunity: The high vitamin C in radish can protect from the common cold and cough and enhance the basic immune system. It also controls the development of harmful free radicals, inflammation and early aging due to its vitamin C content.

Strengthens blood vessels: Radish plays an essential role in the generation of collagen which strengthens the blood vessels and reduces the chance of developing atherosclerosis.

Protects from respiratory disorders: It has anti-congestive vitamins that prevent irritation of the nose, throat, windpipe and lungs from colds, infections and allergies.

Shields from rheumatoid arthritis: The antioxidants present in radish scavenges free radicals from the body thereby preventing cartilage damage due to its vitamin C content. Also, as it aids in collagen formation that in turn helps in cartilage development.

Supports skin care: The radish with its phosphorus and zinc content can help reduce dryness, acne and rashes. Its high-water content keeps the body and skin naturally hydrated.

Consumption of radish: The entire radish plant from roots to its fruits and leaves are edible and used in a range of delicacies in Indian culinary. The most commonly eaten portion is the napiform taproot and leaves. The radish is consumed raw mostly in salads. There are plenty of other ways this vegetable is consumed as in chutneys, curries, dals, kadis, sambar, fry, soups and pickling/fermented and used in stuffed parathas and rotis.

Other uses: The radish seeds can be pressed to extract radish seed oil as wild radish seeds contain about 48.0% oil. Although this oil is not suitable for human consumption, it has potential to be used as biofuel. This root crop has other uses like being used as a cover crop during cooler times to increase soil fertility, provide lost soil nutrients, suppress spread of weeds, help alleviate soil compactness and prevent soil erosion during winter.

Conclusion: Though radish is not a staple vegetable in the diet, its plethora of nutrients and antioxidants

provide umpteen health benefits to combat many life style diseases that are plaguing today's world. The reaping of wellness incentive of this humble vegetable can augmented by adding it to your regular diet to provide micronutrient security.



Fresh radish salad



Radish fry



Pickled radish