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Research · November 2019

DOI: 10.13140/RG.2.2.22117.35041

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Arugula (*Eruca vesicaria* subsp. *sativa* (Miller) Thell.): A healthy leafy vegetable

Article id: 22301

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Arugula (*Eruca vesicaria* subsp. *sativa* (Miller) Thell.) is a lesser-known cruciferous vegetable which offers many of the same benefits as other family vegetables such as broccoli, kale, and Brussels sprouts. It is an annual edible plant in the Brassicaceae family used for its fresh, salty, bitter, tangy and peppery flavor as a leaf vegetable. Other common names include rockets, rocket salad, Italian cress, rucola, rucoli, rugula, colewort and roquette in the garden. It is originated in the Mediterranean region.

Health Benefits:

The popularity of Arugula has as much to do with its health benefits as it has with its taste. Consumption of all kinds of fruits and vegetables has long been related to a reduced risk of many adverse health conditions. Several studies suggest that increased consumption of plant foods such as rye reduces the risk of obesity, diabetes, heart disease, and overall mortality while promoting healthy complexion, increased energy, and overall lower weight. Arugula has high cancer-fighting agents. It contains sulfur-containing compound called sulforaphane gives cruciferous vegetables both their bitter taste and their cancer-fighting power. Sulforaphane is now being studied for its ability to impede cancer with promising early results associated with melanoma, esophageal, prostate, and pancreatic cancers (Kim and Park., 2016).

Researchers have found that sulforaphane can inhibit the enzyme histone deacetylase (HDAC), known to be involved in the advancement of cancer cells. The ability to stop HDAC enzymes could make sulforaphane-containing foods a potentially powerful part of cancer treatment in the future. Arugula contain an antioxidant known as alpha-lipoic acid which has been shown to lower glucose levels, increase insulin sensitivity, and prevent oxidative stress-induced changes in patients with diabetes (Shay *et al.*, 2009). Studies on alpha-lipoic acid have also shown reductions in peripheral and autonomic nerve damage in diabetics. Arugula, like other leafy greens, contains more than 250 milligrams of nitrate per 100 grams (g). It has been shown that high intakes of dietary nitrate lower blood pressure, reduce the amount of oxygen required during exercise, and improve athletic performance (Lidder and Webb., 2013). There are also rich calcium sources besides these Arugula, providing 64 mg in two cups. This delicious green is a nutrient-dense food that is high in fiber and phytochemicals. Arugula is low in sugar, calories, carbohydrates, and fat. It's high in several vital nutrients. These include:

Arugula contains 160 mg of calcium. Calcium normally helps bone health, tooth health, muscle function and nervous function, it is also necessary for blood to clot .

Potassium, a mineral and a heart and nerve function vital electrolyte. Arugula contains 369 mg of Potassium. It also normally helps the muscles contract. Potassium helps to reduce the negative effects of sodium, and it may be beneficial for people with high blood pressure for this reason.

Folate, is a B vitamin. It helps helps in production of DNA and other genetic material. It is mainly important for pregnant women and for those who is planning to become pregnant. Folate deficiency in pregnant women may lead to spina bifida, a neural tube defect.

Vitamin C is a powerful antioxidant, which helps in, develop strong immune system. It is also known as ascorbic acid and important for tissue health and the absorption of iron from food. Arugula contains 15 mg of calcium

Vitamin A, the umbrella term for a group of fat-soluble retinoids. Vitamin A is a powerful antioxidant, which supports immune function, cell growth, night vision, and overall eye health. It also works to help maintain kidney, lung, and heart function. Arugula contains high amount of Vitamin A.

Table 1: Nutrition content of Arugula 100 gm leaf

Nutrient	Value
Water [g]	91.71
Energy [kcal]	25.00
Protein [g]	2.58
Total lipid (fat) [g]	0.66
Carbohydrate, by difference [g]	3.65
Sugars, total [g]	2.05
Calcium, Ca [mg]	160.00
Iron, Fe [mg]	1.46
Magnesium, Mg [mg]	47.00
Phosphorus, P [mg]	52.00
Potassium, K [mg]	369.00
Sodium, Na [mg]	27.00
Zinc, Zn [mg]	0.47
Vitamin C, total ascorbic acid [mg]	15.00
Thiamin [mg]	0.04
Niacin [mg]	0.31
Riboflavin [mg]	0.09
Vitamin B-6 [mg]	0.07
Folate, DFE [µg]	97.00
Vitamin B-12 [µg]	0.00
Vitamin A, RAE [µg]	119.00
Vitamin A, IU [IU]	2373.00
Vitamin E (alpha-tocopherol) [mg]	0.43

Source: USDA,

Plant Biology: It is an annual plant growing to 20–100 cm tall. The leaves are deeply pinnately lobed with four to ten small lateral lobes and a large terminal lobe. The flowers are 2–4 cm diameter with the typical crucifer flower structure; the petals are creamy white with purple veins, and the stamens yellow; the sepals are persistent after the flower opens. The fruit is a typical siliqua (pod) 12–25 mm long with an apical beak, and containing several seeds.

Propagation

Basic requirements Arugula is best grown in the winter and high temperature trigger flowering and the leaves become excessively bitter. Arugula grows best in full sun in a rich, well-draining soil with a pH between 6.0 and 8.0. The plants can tolerate some light shade, particularly in slightly high temperatures.

Planting Arugula is commonly direct seeded and can be planted 1 to 2 weeks before the last frost date. Seeds can also be started indoors 4-6 weeks prior to the last frost to get a head start on the growing season. Arugula grows best in cool temperatures but can be damaged by frosts so it is best to provide it with cover if

a late frost is forecast. Plant seeds by sprinkling on the ground and lightly covering with soil. Keep the soil moist. The seeds should germinate in 3 to 10 days.

Harvesting Arugula is ready to harvest in about 40 days. Harvest leaves from the outside of the plant by pinching them off with your fingers or snipping them with a pair of scissors. The centre of the plant should be left undisturbed to promote new growth.

Growing arugula in container

Because the roots of arugula are relatively shallow, so it can also grow in container. Like most salad greens, arugula seeds are tiny, so cannot plant them too deep. Following are the steps to grow arugula in container:

1. Fill your garden pot up with potting mix, and then gently flatten it out with hand.
2. Distribute the seeds as uniformly as possible onto the potting mix.
3. Use palm, gently pat the seeds onto the soil.
4. Cover them lightly with potting soil or put a thin layer of seed starting mix over the seeds and gently patting again.
5. Add water carefully, either using a rose attachment or a gentle spray from the hose. Care should be taken that water pressure or weight of the water to disturb seeds and drive them too deeply into the soil.

Harvesting

Arugula seedlings are fully grown and ready to harvest in about three to four weeks. The younger the leaves the more tender and sweet they will be. Once the seedlings are 3 to 4 inches long, plant should be either pull out or thin out. To continue the growth only top leaves should be cut.

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Fig: Leaves of Arugula (*Eruca vesicaria* subsp. *sativa* (Miller) Thell.