



## Exotic vegetables: A boon to health

Monika Sood, Julie D. Bandral and Neeraj Gupta

Division of Food Science and Technology, Faculty of Agriculture, S.K. University of Agricultural Sciences and Technology of Jammu, Chatha, Jammu (J&K) India

(Email: [monikasoodpht@gmail.com](mailto:monikasoodpht@gmail.com))

Exotic crops are plants or plant parts that are introduced in India and which are not common in domestic crop production or in the traditional Indian cuisine. In India, currently, vegetables that are referred as exotic have been introduced in the last few decades. Some of these exotic vegetables in India are not yet household names, while some of them are slowly gaining popularity (Rao and Mrunalini, 2015). Still, for now, these vegetables are primarily confined to elite restaurants and affluent Indian families. Exotic vegetables have very high market value in India; they are commercially cultivated mostly in poly-houses or green shade net houses. Most of these vegetables are best grown in India's winter season only. The seeds are sown in October-November for best results. Many of them grow well in partial sunlight and some of them can withstand full sunlight at least in winters. The plants need well-drained soil and organic manure.

### Exotic vegetables in India (Sharma, 2018):

**Asparagus:** Asparagus is a spring vegetable that's packed with nutrition. This popular vegetable comes in a variety of colours, including green, white and purple. It is a very good source of fibre, folate, vitamins A, C, E and K, as well as chromium, a trace mineral that enhances the ability of insulin to transport glucose from the bloodstream into cells. This vegetable has ability to neutralize cell-damaging free radicals thus slowing the aging process and reduce inflammation. It also contains high levels of the amino acid asparagine, which serves as a natural diuretic and increased urination not only releases fluid but helps rid the body of excess salts. 1 cup of cooked asparagus has 40 calories, 4 g of protein, 4 g of fibre and 404 mg of potassium.

**Uses:** The best way to consume asparagus is to roast, grill or stir fry it. Quick cooking works well to preserve the nutritional content and the antioxidants present in it. You can also add it to your soups and curries. It's used in

dishes around the world, including frittatas, pastas and stir-fries.

**Broccoli:** Broccoli is a branched, green vegetable with either purple or more commonly green flower buds. Broccoli is an excellent source of vitamin K, vitamin C, chromium and folate. It is a very good source of dietary fibre, pantothenic acid, vitamin B6, vitamin E, manganese, phosphorus, choline, vitamin B1, vitamin A (in the form of carotenoids), potassium and copper. Broccoli is also a good source of vitamin B1, magnesium, omega-3 fatty acids, protein, zinc, calcium, iron, niacin and selenium. Broccoli has a significant amount of protein, 2.5 g per one-cup serving.



Broccoli has only a trace amount of fat and is cholesterol-free. It does, however, contain a small amount of omega-3 fatty acids, in the form of alpha-linolenic acid (ALA). Broccoli is bursting with vitamins and minerals. It's an excellent source of immune-boosting vitamin C, providing over 81mg. It is also an excellent source of vitamin K. Consuming steamed broccoli regularly lowers the risk of cardio-vascular disease by reducing the total amount of cholesterol in the body. A key component of broccoli is a phytochemical known as sulforaphane, which also gives broccoli a slight bitter taste. Studies have shown that sulforaphane may play a part in enhancing detoxification of airborne toxins, such as cigarette smoke, and could help reduce the risk of certain cancers.

**Uses:** Broccoli can be eaten raw or can be prepared using a variety of cooking methods. Steam, sauté, or roast to compliment your main meal or use the stems to make soup. It is often used to make stir fry, pasta, fried rice. Avoid overcooking, as it will not only make it less visually appealing but will reduce the availability of vitamins and minerals.

**Coloured capsicum (Bell peppers):** These are non-pungent varieties of bell pepper available in yellow, red, orange colours. Fresh bell peppers, red or green, are a

rich source of vitamin-C. It also contains healthy levels of vitamin-A. 100 g of sweet pepper has 3131 IU or 101 per cent of vitamin A. Additionally, antioxidant flavonoids such as alpha and beta carotenes, lutein, zeaxanthin and cryptoxanthin also found in them. Bell pepper has adequate levels of essential minerals in it like iron, copper, zinc, potassium, manganese, magnesium and selenium. Sweet pepper is also good in the B-complex group of vitamins such as niacin, pyridoxine (vitamin B-6), riboflavin and thiamine.

*Uses:* Fresh bell peppers are treated just like any other vegetables in the kitchen and can also be eaten raw in salads or cooked in stir-fries. Their firm, crunchy texture together with delicate sweet flavour makes them one of the most sought after vegetables for cooking.

**Cherry tomato:** This is a small distinct variety of tomato treated as a different vegetable. Cherry tomatoes hold same calories as regular, large tomatoes; 18 calories per 100g. they are excellent sources of antioxidants, dietary-fibre, minerals and vitamins. Cherries are fine sources of antioxidants including lycopene, zeaxanthin, cryptoxanthin and  $\alpha$  and  $\beta$ -carotenes. They are excellent sources of vitamin-A; 100g provides 833 IU, antioxidant vitamin-C. Fresh cherry tomato is very rich in potassium. 100g contain 237 mg of potassium and just 5 mg of sodium thus, helps to maintain healthful blood pressure. They compose healthy levels of B-complex vitamins such as folates, thiamin, niacin, riboflavin as well some essential minerals like iron, calcium, manganese and other trace elements.

*Uses:* Cherry tomatoes are generally preferred in salads, gentle stir-fries, sandwiches and commonly featured in pizzas.

**Chinese cabbage:** Although referred as cabbage, this vegetable belongs to different species and is more closely related to Turnip. Cabbage is incredibly low in calories. 100 g fresh leaves carry just 16 calories. Including Chinese cabbage or bok choy in your diet can be extremely beneficial for your heart. It is because the vegetable is full of two most important minerals – calcium and potassium, which can regulate the blood pressure levels efficiently. It contains many antioxidant plant compounds such as carotenes, thiocyanates, indole-3-carbinol, lutein, zeaxanthin, sulforaphane and isothiocyanates. Also, it is an abundant source of soluble and insoluble dietary fibre. Fresh cabbage is an excellent source of folates (100 g provides 79  $\mu$ g), vitamin C, moderate levels of vitamin-K, small levels of vitamin-A. It is a good source of many essential vitamins such as riboflavin, pantothenic acid,

pyridoxine and thiamin. Also, it is a very natural source of electrolytes and other minerals like phosphorus, manganese, iron and magnesium.

*Uses:* It can be consumed in the form of raw greens, in stews or as pickles, in *chow mein* (stir-fried noodles), fried rice, soups, stuffing etc.

**Purple cabbage/ Red cabbage:** This is a separate variety of cabbage with distinct purple-red pigmentation. On cooking, this cabbage will usually turn blue. To retain the red colour, it is necessary to add vinegar or acidic fruit to the pot. Red cabbage contains just 21 calories per 100g, being 90 per cent water. It has a little protein at 1g per 100g, negligible fat and around 4g per 100g of carbohydrates, from naturally occurring sugars. Red cabbage is also quite a good source of fibre at 3g per 100g. Red cabbage has a good mix of vitamins and minerals, especially folate, which is essential during pregnancy and also helps the body to produce red blood cells. It also contains vitamin C (more than orange), which helps protect our cells by acting as an antioxidant and potassium, which we need for a healthy heart. The amino acid glutamine, found in high concentrations in red cabbage juice, has long been used as an anti-inflammatory for treating stomach ulcers. The dark pigment of the cabbage indicates a higher level of antioxidants, which are known to reduce oxidative stress. A higher level of anthocyanins, an antioxidant, specifically found in purple cabbage, lowers the risk of cancer and heart diseases.

*Uses:* Saute this red cabbage with some seasoning and some vinegar to eat it as a side dish, consume this vegetable raw in a salad form, can use the same technique as the green cabbage to cook the red one also. This particular cabbage best goes with Chinese culinary and Manchurians etc.

**Zucchini :** This variety of summer squash belongs to the same species that of other squashes and pumpkin. Zucchini contains zero fat. It also contains significant amounts of vitamins B6, riboflavin, folate, C and K and minerals, like potassium and manganese. Zucchini is high in water. It also contains significant amounts of fibre, electrolytes and other nutrients that are necessary for a healthy digestive system. It is low in fat and sodium, but high in fibre and potassium. These properties help to maintain healthy blood circulation. The summer squash also contains antioxidant and anti-inflammatory phytonutrients including vitamin C, beta-carotene, manganese, zeaxanthin, and lutein. Zucchini contains high amounts of vitamin C and polyphenols, especially in the peels.

*Uses:* Add it raw to salads. Stew it with other summer

fruits and vegetables. Stuff with rice, lentils, or other vegetables, then bake it. Boil it, then blend it into soups. Serve it as a side, grilled or sautéed with a little garlic and oil. Bake it into breads, pancakes, muffins, or cakes.

**Pak-choy:** Like most vegetables, pak choy has a negligible amount of fat. There is a small amount of protein in pak choy, about 1 gram per 1 cup serving, so it is not a significant source of this macronutrient. It is an excellent source of vitamin C, vitamin K, vitamin A and beta-carotene. It is a very good source of folate, calcium and vitamin B6 as well coupled with its lack of cholesterol, all help to maintain a healthy heart. Like many fruits and vegetables, especially bright or dark-colored ones, pak choy contains antioxidants, which help the body fight inflammation and cell damage. The iron, phosphorus, calcium, magnesium, zinc and vitamin K in pak choy all contribute to building and maintaining bone structure and strength. Selenium helps to detoxify some cancer-causing compounds in the body. Cruciferous and other vegetables also offer protection because they provide fibre. Fibre keeps the stool moving. This keeps the bowel healthy and reduces the risk of developing colorectal cancer.

*Uses:* People can consume all parts of pak choy. In addition to its low-calorie and high nutrient content, its mildly sweet flavour and crisp texture make it an agreeable addition to almost any dish. It can be prepared using different methods, including steaming, stir-frying, braising, grilling, and stewing. A short cooking time will give you a crunchy result, while longer cooking yields a uniquely creamy texture. It can be used in salads, hot n sour soup, stir fry etc.

**Celery :** Celery is naturally low in calories, carbohydrates, fat and cholesterol. Celery contains vitamin C, beta carotene and flavonoids, but there are at least 12 additional kinds of antioxidant nutrients found in a single stalk. It's also a wonderful source of phytonutrients, which have been shown to reduce instances of inflammation in the digestive tract, cells, blood vessels, and organs. The fibre in celery can benefit the digestive and cardio-vascular systems. Celery is about 95 per cent water. This can make it a good way to keep necessary fluid levels up. Celery is

rich in minerals like potassium and folate; vitamins like A, K and C. With minerals like magnesium, iron and sodium, celery can have a neutralizing effect on acidic foods.

*Uses:* The leaves of the celery function as a fresh seasoning for soups or stews and impart a slightly spicy taste akin to black pepper. It is also readily used in its dried form. It turns into a dry herb that again can be used in myriad dishes to enhance the flavour. Fish or meat with dry celery seasoning is a popular dish in several cuisines the world over. Even its seeds are highly useful. The oil is extracted from them, which is used extensively in perfumes. Ground celery seeds also provide celery salt that again is used for seasoning for its flavorsome and spicy taste. Celery is diverse enough to be used in different dishes like sandwiches, dips and sauces, soups and salads etc.

**Parsley:** Parsley is a versatile herb that provides a concentrated source of nutrients. Parsley is low in calories yet rich in important nutrients, such as vitamins A, K and C. It's a good source of the B vitamin folate. Vitamin A is an essential nutrient that plays a key role in your immunity and eye health. Parsley is also a great source of vitamin K, a nutrient that supports bone and heart health. Parsley is packed with vitamin C, a nutrient that improves heart health and is vital to your immune system. Parsley contains essential oils, including apiol and myristicin, which have antibacterial effects and fight potentially harmful bacteria. Parsley is rich in potassium, magnesium, and calcium- all of which are essential to bone health. Lutein, beta carotene, and zeaxanthin are three carotenoids in parsley that help protect your eyes and promote healthy vision.

*Uses:* It's commonly used to elevate the flavour of dishes like soups, salads and fish recipes. It can be used to garnish on pasta, soup, homemade pizza, bread, juices etc.

#### References:

**Rao, C.C. and Mrunalini Sasanka, V. (2015).** Exotic veggies: A practical utility of innovation lured by the easy returns. *Int. J. Appl. Res.* **1**(12): 1038-1041.

**Sharma, P. (2018).** Underutilized vegetable crops and their importance. *J. Pharmacognosy Phytochem.* **7**(5): 402-407.

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