



The Nutritional and Functional Property of Unconventional Food Plant: Nasturtium (*Tropaeolum majus* L)

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Abstract

Tropaeolum majus L., or garden nasturtium, is a member of the Tropaeolaceae family. Imported to Europe in the sixteenth century, it originated in South America. It's a plant with several therapeutic uses. Medicinal plants, like garden nasturtium, have bioactive chemicals and trace elements that the body may readily absorb. Microelements including potassium, phosphorus, calcium, and magnesium, as well as macro elements like zinc, copper, and iron, are abundant in the flowers and other sections of the nasturtium plant. The chemicals extracted from the flowers, leaves and essential oil exhibit antibacterial, antifungal, hypotensive, expectorant and anticancer activity. Hence, the present review is focussed on nutritional and functional potential of Nasturtium.

Keywords: Nasturtium; Flowers; Nutritional; Food Plant

Introduction

The term UFP (PANC) refers to unconventional food plants, which are plants that grow naturally and include fruits, vegetables, flowers, and herbs. Since most people are unaware of them, they are sometimes mistaken for weeds [1].

The Tropaeolaceae family includes the garden nasturtium (*Tropaeolum majus* L.). There are several names for this plant, including monks cress, Indian cress, and garden nasturtium. wildly in the mountainous areas of Central and South America. In these two regions, it occurs as a perennial plant. It was introduced to Europe from Peru in the sixteenth century and is now grown effectively as an annual ornamental plant. There are several variations of the plant that varies in terms of size, shape, and blossom colour. The delicately vine-like stems of the garden nasturtium range in length from 25cm to 5 metres. They slink over the floor or scale structural elements. The vine and the bushy forms are the two most common types of the plant in Poland. While the bushy type (var. numenum) can grow up to 30 cm tall, the latter (var. altum) can have shoots up to 5 metres long. The thick, delicate, fleshy branches readily root when resting on the ground [2].

The leaves have long petioles that entangle supports, are round, have soft edges, and exhibit yellow-green venation. The blooms are big, featuring a bilabial calyx and a spur on the bottom lip. They

have long pedicels that emerge from the angles of the leaves and resemble tiny, 4-5 cm broad trumpets. One calyx produces a long, up to 28 mm protrusion known as a nectar tube. There may be one, two, or three blooms. Five petals make up the flower's crown, and their hues vary from brick red to orange to yellow. The root is branching and short. The shrub bears fruit and flowers from May to November [3].

A distinct, strong scent permeates the entire plant. The garden nasturtium is quite susceptible to cold temperatures due to its origins. For this reason, in the middle of May, seeds are sown on soil that has been well-aerated. After 15-20 days, the seeds germinate, and after 8-10 weeks, the flowers emerge. The plant thrives in areas that are either slightly shaded or well-lit. It needs humidity and light, medium-fertile soil.

The overuse of nitrogen fertilisers causes the plant to produce more leaves but fewer blooms, which is detrimental to the plant. Raising the plant requires aerating the soil and removing weeds [4].

Nutritional and medicinal property

The glucosinolate compound known as gluconasturtin, which is found in nasturtium, has long been used to treat diabetes, an endocrine chronic condition marked by increased blood glucose

levels and abnormal carbohydrate metabolism. It is an essential medicinal herb and significant economic resource. They are utilised as salad ingredients and as veggies rather often. Additionally, in previous years, experimental evidence has demonstrated their efficacy against specific diseases [5].

The plant has active compounds such as glutanosturtine, which have potent anticancer action. In addition to being anticancer, it also has antituberculosis, anti-inflammatory, antibacterial, cardioprotective, and antidiabetic properties. Therefore, it may be considered and utilised as a source for dietary supplements and nutraceuticals. The plant has been used specifically to treat tuberculosis (TB) because of its antiscorbutic, depurative, diuretic, expectorant, purgative, hypoglycemic, odontalgic, stimulant, and stomachic leaves [6].

The freshly extracted juice has been applied topically and internally to cure a variety of conditions, including skin inflammation, persistent irritations, renal problems, and chest and kidney ailments. When used topically, it's well-known for being a potent hair tonic that encourages the development of thick hair. It is suggested to use caution while applying a poultice of the leaves as they may effectively repair glandular tumours or lymphatic swellings. Excessive usage of the plant may cause upset stomach. The leaves are utilised fresh and may be gathered nearly all year round [7].

Nasturtium is regarded as one of the pioneers in the usage of flowers in human food and is classified as a decorative flower in addition to having a pleasing visual appeal for consumers. This subtropical plant may be cultivated all year round as long as it receives irrigation during the driest times of the year. It also adapts well to partially shaded situations [8].

Numerous physiologically significant substances have been found in nasturtium, including carotenoids that belong to the phenolic chemical group and flavonoids (isoquercetin, kaempferol). Furthermore, micronutrients like as potassium, phosphorus, calcium, magnesium, zinc, copper, and iron are abundant in this plant. Furthermore, because of these qualities, it has several health-promoting qualities, including antibacterial, hypotensive, antioxidant, and anticancer effect [9].

Foods that include phenolic compounds, vitamin C carotenes, and other colours have a higher antioxidant activity. Additionally, the concentrations of specific components in food affect how they behave. There is currently little information on the nutritional characteristics of nasturtium leaves and stems in the literature. However, some research indicates that the leaves contain minerals, mostly zinc, and that they may be used to stews, omelettes, salads, and even infusions. The leaf extract also contains antihypertensive and anticoagulant properties, and it aids in the treatment of uri-

nary tract infections. Along with the leaves, the stalks can be utilised in a variety of culinary recipes [10].

Adrenoleukodystrophy is a serious and degenerative condition that can be treated using Lorenzo's Oil, which is derived from the seeds of the nasturtium fruit. More than 96% of the oil produced from the seeds is comprised of monounsaturated fatty acids, and in certain plant species, erucic acid concentration can exceed 80%. Furthermore, young fruits with a distinctive caper flavour can be preserved by immersing them in white vinegar for around 12 days. Lastly, ripe seeds can be pulverised, roasted, and then used in lieu of black pepper [5].

Since edible flowers have an antioxidant profile that is frequently on par with or even higher than that of regular fruits, eating them might be regarded as a nontraditional cuisine. Nasturtium blossoms come in a variety of colours, including red, yellow, and orange. Depending on their hue, these flowers can have stronger antioxidant capacities. Red nasturtium, for instance, has a higher anthocyanin concentration, which, when paired with a healthy lifestyle, is linked to a decreased risk of chronic illnesses. Consuming yellow flowers is associated with improved eye health because they contain greater quantities of total carotenoids, such as lutein. Comparing orange flowers to red and yellow blooms, the former have intermediate amounts of carotenoids and phenolics [11].

Nasturtium flowers tend to be rich in flavonoids (quercetin, kaempferol, myricetin, rutin, and catechin) and anthocyanins (pelargonidin, cyanidin, and delphinidin), which are compounds with important anti-inflammatory, antioxidant, and hypotensive properties. Consequently, eating *Tropaeolum majus* L. may have positive health impacts on people [12].

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