# NASTURTIUM OFFICINALE BROWN (SEMRI SAG): AS A VEGETABLE WITH HIGH NUTRITIONAL VALUE

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**Abstract**

*Nasturtium officinale* is one of the common plants found growing wildly along the ditches and marshy places. Many people across the globe have been eating this plant as salad or as cooked vegetable since the time immemorial. In Bhutan, many Bhutanese have been eating this plant for centuries. Some Bhutanese have even been taking it for curing many illnesses including liver disorders. The literature review substantiated this curative claims and have been found to be rich in iron and many other micronutrients. This paper describes the plant, its ethno-medical uses, nutritional contents and the methods of use.

**Keywords:** *Nasturtium officinale, semrisag, micronutrients, nutritional contents.*

## Introduction

*Nasturtium officinale* is known today as *Rorippa nasturtium-aquaticum* (L) hayek (see Table 1). This plant belongs to the Cruciferae family. In English it is called Water-cress. In Bhutan, southern Bhutanese called it Semri sag and is eaten as salad or cooked vegetable. Japanese also eat them as salads. This plant is sold as vegetable in the Thimphu vegetable market. It grows around the streams and ditches and flowers in June. It is either erect or spreading that copiously roots at the lower nodes (see pictures below).

One of its brother species called Byi-laphug is used in Bhutanese traditional medicine and has similar characteristics.

**Table 1. Summary of *Nasturtium officinale***

| | | | |
|---|---|---|---|
| Author | R.Br. | Botanical references | 17, 200 |
| Family | Cruciferae | Genus | Nasturtium |
| Synonyms | *Rorippa nasturtium-aquaticum*-(L.)Hayek.<br>*Sisymbrium nasturtium-aquaticum* - L. | | |
| Known Hazards |  Whilst the plant is very wholesome and nutritious, some care should be taken if harvesting it from the wild. Any plant growing in water that drains from fields where animals, particularly sheep graze should not be used raw. This is due to the risk of it being infested with the liver fluke parasite. Cooking the leaves, however, will destroy the parasites and render the plant perfectly safe to eat. | | |
| Range | Europe, including Britain, from Sweden and Denmark south and east to N. Africa and W. Asia. | | |
| Habitat | Stream margins, ditches, flushes etc with moving water, usually in chalk or limestone areas. | | |
| Edibility Rating |  (1-5) | Medicinal Rating |  3 (1-5) |

**Distribution**

As shown in Table 1, this plant is cosmopolitan and has been reported worldwide. In Bhutan, it is found in many marshy places growing wild especially in the ditches.

**Ethno-medical use**

The ancient Greek General and the Persian King Xerxes ordered their soldiers to eat it to keep them healthy. The Greeks additionally believed that "Eating cress makes one witty". Applied externally, it has a long-standing reputation as an effective hair tonic, helping to promote the growth of thick hair.

The Japanese use it as stomachic, diuretic, anthelmintics and anti-pyretics. Water cress is mainly used as a garnish or as an addition to salads, the flavour is strong with a characteristic hotness. It has a reputation as a spring tonic, and this is its main reason of use, though it can be harvested for most of the year and can give 10 pickings annually. Some caution is advised if gathering the plant from the wild, since it may be toxic. The leaves are exceptionally rich in vitamins and minerals, especially iron. The seed can be sprouted and eaten in salads. It has a hot mustardy flavour. The seed is ground into a powder and used as mustard. The pungency of mustard develops when cold water is added to the ground-up seed - an enzyme (myrosin) acts on a glycoside (sinigrin) to produce a sulphur compound. The reaction takes 10 - 15 minutes. Mixing with hot water or

vinegar, or adding salt, inhibits the enzyme and produces mild but bitter mustard. In Bhutan, many southern Bhutanese claim that it is good for healing liver related diseases

**Chemical Constituents**

Similar to many other members of the cabbage family (black and white mustard) all cress owe their aroma to isothiocyanates. The isothiocyanates are formed from inactive precursors called glucosinolates as a reaction to injuries.

Water cress contains gluconasturtiin, which yields the 2-phenylethyl isothiocyanate (C6H5-CH2-CH2-NCS). In contrast, the pungency of nasturtium leaves comes from benzyl isothiocynate, (C6H5-CH2-NCS), which is created from glucotropaeolin (benzyl glucosinolate); yet in nasturtium seeds, another glucosinolate was found (glucoputranjivin), which yields isopropyl isothiocyanate on enzymatic hydrolysis. Benzyl isothiocyanate is closely related to the pungent principle of white mustard, but much more volatile and, thus, less persistent.

Since all these isothiocyantes are volatile and much susceptible to heat and moisture, cress aroma is most delicate; thus, cress leaves are always used fresh, never dried, and should not be boiled, baked or otherwise heated.

Other plant constituents include Arginine, Aspartic-acid, Beta-carotene, Biotin, Folacin, Glutamic-acid, Glycine, Histidine, Isoleucine, Lysine, Methionine, Pantothenic-acid, Phenylalanine, Serine, Threonine, Tryptophan, Tyrosine, and Valine.

**Nutritional Content of Leaves (Fresh Weight)**

- Calories per 100g

- Water: 93.3%
- Protein: 2.2g;
- Fat: 0.3g;
- Carbohydrate: 3g;
- Fibre: 0.7g;
- Ash: 1.2g;
- Minerals-Calcium: 151mg; Phosphorus: 54mg; Iron: 1.7mg; Magnesium: 0mg; Sodium: 52mg; Potassium: 282mg; Zinc: 0mg.
- Vitamins - A: 2940mg; Thiamine (B1): 0.08mg; Riboflavin (B2): 0.16mg; Niacin: 0.9mg; B6: 0mg; C: 79mg.

**Medicinal Uses**

Antiscorbutic; Depurative; Diuretic; Expectorant; Hypoglycaemic; Odontalgic; Purgative; Stimulant; Stomachic; TB.

Watercress is very rich in vitamins and minerals. It has long been valued as a food and medicinal plant. Considered a cleansing herb, its high content of vitamin C makes it a remedy that is

particularly valuable for chronic illnesses. The leaves are antiscorbutic, depurative, diuretic, expectorant, purgative, hypoglycaemic, odontalgic, stimulant and stomachic. The plant has been used as a specific in the treatment of TB. The freshly pressed juice has been used internally and externally in the treatment of chest and kidney complaints, chronic irritations and inflammations of the skin etc. Applied externally, it has a long-standing reputation as an effective hair tonic, helping to promote the growth of thick hair. The freshly pressed juice has been used internally and externally in the treatment of chest and kidney complaints. A poultice of the leaves is said to be an effective treatment for healing glandular tumours or lymphatic swellings and chronic irritations and skin inflammations. Some caution is advised, excessive use of the plant can lead to stomach upsets. The leaves can be harvested almost throughout the year and are used fresh.

Culpepper says that the leaves bruised or the juice will free the face from blotches, spots and blemishes when applied as a lotion. Other plant constituents such as Arginine, Aspartic-acid, Beta-carotene, Biotin, Folacin, Glutamic-acid, Glycine, Histidine, Isoleucine, Lysine, Methionine, Pantothenic-acid, Phenylalanine, Serine, Threonine, Tryptophan, Tyrosine, and Valine, indicate that this plant may be useful for many other conditions. Further research needs to be done.

The juice of the plant is nicotine solvent and is used as such on strong tobaccos.

**Conclusion**

There is no way to conduct phytochemical and pharmacological testing at PRU. However, this plant has been widely researched and commonly used worldwide for many purposes. From the literature review, although this plant has been used for treating many ailments and as nutritional supplements, there was no mention of this plant being used for treating liver disorders. Nonetheless, there are cases where diseases indirectly related are being treated by this plant. But caution must be taken especially in Bhutan, since the plant is grown in the wild and may be toxic due to infestation by liver flukes.

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