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A BRIEF STUDY ON BEETROOT: A REVIEW

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ABSTRACT

Beetroot has gained interest in recent year, recognized as health promoting food due to presence of essential components such as vitamins, minerals, phenolics, carotenoids, nitrate, ascorbic acids and betalains that promote health, also recognizable as a food dye due to non-precarious, non-toxic, non-carcinogenic and non-poisonous nature. Beetroot is premeditated as a boon for the food industry and used as food colorant or additive in food products such as ice-cream, yogurts and other products. Beetroot is used as a vegetable, and its juice and extracts also serve as traditional medicine, food colorant and additive to cosmetics. This plant has high antioxidant and anti-inflammatory properties and important aid in the treatment of many diseases. Overall, the objective of this review is to provide a brief knowledge in Beetroot (Beta Vulgaris L.).

INTRODUCTION

Beetroot (Beta vulgaris L.) is belonged to Amaranthaceous family having bright crimson colour, famous for its juice value and medicinal properties; and known by several common names like beet, chard, spinach beet [1]. Beetroot includes a variety of edible taproots originated from the Middle East, which have been spreading over the Americas, Europe andAsia. Beetroot has a health-promotional characteristics, antioxidant and anti-inflammatory effects, anti-carcinogenic and diabetic activities and hepato-protective, hypotensive and wound healing properties and therefore used in various ingredient and as a supplementation.[2]. The extract of beetroot is used to improve the redness in tomato pastes, soups, sauces, desserts, jams, jellies, sweets and breakfast cereals [3]. It contains numerous nutrients including sodium, magnesium, potassium, vitamin C, betanin and antioxidants, containing phenolic compound, cartenoids, betalain, vitamins and minerals which are major important bio compound and micronutrients, and it is the 10th most powerful vegetables with antioxidant properties [4].

Figure1: Beetroot

Family: Amaranthaceae Species: Beta Vulgaris

Subspecies: Beta Vulgaris subsp. VulgarisCultivar Group: Conditiva group

Origin: Sea Beet (Beta Vulgaris subsp. maritima)

In addition, beetroot is particularly rich in betalains, a group of nitrogen-containing colourcompounds that are not commonly represented among edible plants. Betalains can be divided into two subclasses: the red/purple betacyanin's which are responsible for the colour of red beetroot or the yellow/orange betaxanthins that contribute to the colour ofyellow beetroot. White beetroot is deficient in betacyanin's and there are no other differences between beetroot varieties. (5,6). Beetroot is mainly consumed as a pickle canned preserve, a cooked vegetable or sometimes a juice [7]

Figure2: Beetroot juice

ORIGIN AND DESCRIPTION

It is originated in North Africa and spread through the Mediterranean Sea route, occupyingthe seashores of Europe, Asia and the Americas [8].

Beetroot is an herbaceous biennial (flowering in the second year of growth) or, rarely, perennial plant up to 120 cm (up to 200 cm in second year) in height, cultivated forms are mostly biennial, roots of the cultivated forms are dark red, white, or yellow, and moderatelyto strongly swollen and fleshy or brown, fibrous, sometimes swollen and woody in the wild subspecies

BENEFITS OF BEETROOT

It provides a wide range of benefits such as:

-Improving digestion

-Lowering the risk of diabetes

-Anaemia

-Cancer

-Vomiting

-Food poisoning

-Gastric ulcers

-Kidney ailments

-Liver toxicity

-Hepatitis

-Food colouring

- Colorant of cosmetic and drug

The leaves of beetroot are an excellent source of vitamin A, K, C and E. It may be consumed as: Raw,juice, salad, boiled, baked, as chips or dried in any other combinations, even in various food dishes.

Peter C. Wotton-beard [10] study shows that a juice of beetroot provides a significant number ofpolyphenols, and a shot provides a quantity of bioactive compounds.

PROPERTIES OF BEETROOT

Betalain is the main bioactive compound belong to the class of red and yellow pigments, present in beetroot. Betalain contains two categories of pigments, betacyanin the violet oneand betaxanthin the yellow to orange pigment. Betanin exhibits an antioxidant activity that is ten times higher than tocopherol, and three times higher than catechin [11]

Betalain, play an important role in human health because of the pharmacological activities as an antioxidant, anti-cancer, anti-inflammatory, hepatoprotective, anti-lipidemic and antimicrobial agent. They inhibit cervical ovarian and bladder cancer cells in vitro and can also inhibit the proliferation of cells in human tumours. Consumption of beetroot in shot orin a juice can reduced the incidence of tumours in skin, lung, liver, colon, and esophagus [12].

It is viewed as a promising therapeutic treatment in a series of clinical pathologies associated with oxidative stress and inflammation. Beetroot is a good tonic food for health.The market for beetroot is not a large market but it is significant.

BEETROOT JUICE AS A SUPPLEMENT

Beetroot juice supplementation positively affect performance of trained master swimmer resulting in a reduction of aerobic energy cost and increased workload at anaerobic threshold, whereas maximum oxygen uptake and maximum workload are not affected [13]. It is a nitrate-rich dietary source which has been used in athletic setting for evaluating its performance through time-to-exhaustion protocols, containing approximately 5-8 mmol.[14]

Beetroot juice elicited a significant suppression of postprandial glycaemia in the 0–30 minsAUC ($P < 0{\cdot}05$) and postprandial insulinaemia in the 0–30, 0–45 and 0–60 sAUC ($P<0.05$) when compared with a control beverage matched for CHO content, which was comparable with that observed using berries in other investigations. Analysis of HPLC of the beetroot juice revealed the predominant secondary metabolite (excluding nitrate) in this product isthe yellow/orange pigment neo betanin, derived from betanin, as well as significant, but

much smaller, amounts of other betalains and polyphenolic compounds. Neo betanin's size and chemical properties (for example, conjugated system) are similar to those of flavonoid polyphenolics such as anthocyanins and it is suggested, therefore, that neo betanin probablycontributes to the observed effect, which has similar effects for polyphenolic compounds.

Insulin sensitivity models applied to the data suggested that insulin sensitivity in the testedcohorts was non-significantly increased with beetroot juice compared with control [15].

Beetroot as a health promoting functional food may be potentially beneficial in cancer. As a source of polyphenols, flavonoids, dietary nitrates and other useful nutrients, beetroot supplementation may provide a holistic means to prevent cancer and manage undesired effects associated with chemotherapy [16].

CONCLUSION

Beetroot (Beta vulgaris) is a root vegetable also known as red beet, garden beet, table beet, or just beet, which is rich in essential nutrients as fibre, folate (vitamin B9), manganese, potassium, iron, and vitamin C, also used in the food industry because of its natural and harmless pigments and colorant properties and absence of toxicity. The conclusion of beetroot is that it has a wide range ofpotential health benefits properties by reducing high blood pressure, improving digestion and lowering the risk of diabetes etc. can be taken as a supplementation and in various food ingredients.

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