Indian J.Sci.Res. 13 (2): 170-171, 2017 ISSN: 0976-2876 (Print)
ISSN: 2250-0138 (Online)

ESTIMATION OF CHLOROPHYLL CONTENT OF SOME GREEN LEAFY VEGETABLES FOR THEIR BIOCHEMICAL PROPERTIES

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ABSTRACT

Chlorophyll is a green pigment, that's instrumental in photosynthesis. Studies also suggest it's instrumental in promoting good health. Chlorophyll benefits the body in a unique and distinctive ways. It helps to cleanse harmful toxins from the body and it is also used to fight infection. A recommended and regular intake of chlorophyll can keep the circulatory and digestive system much healthier. Environmental pollutants such as toxic metals can quickly destroy health. Chlorophyll binds with toxic metals to hamper absorption, and studies have also shown it can do the same with some carcinogens. In the present study, the chlorophyll content was extracted from the leaves of twelve herbaceous plants which are being used as leafy vegetables. Observations were characterized by spectroscopy. Concentration of chlorophyll a and b was calculated using N, N-Dimethylformamide incubation method. *Coriandrum sativum* was identified as having maximum chlorophyll content (2.33mg/ gram of fresh weight of leaf) as compared to other test plants.

KEYWORDS: Chlorophyll a, Chlorophyll b, Leafy Vegetables, Spectroscopy

As we all know that leaf chlorophyll content is an important parameter for testing plant status. For example, chlorophyll content can be used as an index of the photosynthetic potential as well as of plant productivity (Carter, 1998; Filella et al., 1995). In addition, chlorophyll gives an indirect estimation of the nutrient status because much of leaf nitrogen is incorporated in chlorophyll (Filella et al., 1995). In recent years, chlorophylls, the most abundant pigments in green plants are gaining increasing importance in the human diet, not only as food colorants, but also as healthy food ingredients. (Xue and Yang, 2009).

Chlorophyll is a green pigment, which is structurally similar to porphyrin pigments such as heme and it is produced through the same metabolic pathway. Chlorophyll benefits the body in a unique and distinctive ways. It helps to cleanse harmful toxins from the body and it is also used to fight infection. A recommended and regular intake of chlorophyll can keep the circulatory and digestive systems much healthier.

In general people consume lot of green leaves as vegetables or as condiments. In this way directly or indirectly chlorophyll contents play a major role in making us healthy. Green leafy vegetables as against chlorophyll are a rich source of minerals (including iron, calcium, potassium, and magnesium) and vitamins, including vitamins K, C, E, and many of the B vitamins. They also provide a variety of phytonutrients including beta-carotene, lutein and zeaxanthin, which protect our cells from damage and our eyes from age-related problems, among many other effects. Dark green leaves even contain small amounts of Omega-3 fats. Perhaps the star of these nutrients is Vitamin K. A cup of cooked greens provides at least nine times the minimum recommended intake of Vitamin K. Recent research has provided evidence that this vitamin may be even more important than we once thought, as it regulates blood clotting, protects bones from osteoporosis, help prevent atherosclerosis by reducing calcium in arterial plaques, protect us from arthritis, help prevent diabetes etc. So the more the chlorophyll content the more nutritious the leaves will be.

In the present study chlorophyll content of some common leafy vegetable plants was estimated and compared for their nutritional value in terms of amount of chlorophyll present in them.

MATERIALS AND METHODS

N, N-Dimethyl formamide incubation method (Inskeep and Bloom,1985 with Annon,1949) was followed for chlorophyll estimation of *Coriandrum sativum, Spinacea oleracea, Brassica campestris, Mentha arvensis, Allium cepa, Raphanus sativus, Brassica oleracea var. botrytis, Brassica oleracea var. capitata, Chenopodium album, Amaranthus tricolor, Alternanthera sp.* and *Trigonella foenum-graecum*.

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Analytical reagents used during the extraction process were of AR grade. Distilled water was used wherever needed. Quartz cuvette (1cm2) were used and corresponding solvent was taken as reference during spectrophotometric observation. Every procedure (for each plant sample and extracting solvent) was triplicated for maintaining the precision of analytical results.

A Systronic made spectrophotometer was used for chlorophyll estimation at 664.5nm and 647.4 nm.

RESULTS AND DISCUSSION

Healthy leaves of test plants were taken and after washing and drying, (under fan) chlorophyll estimation test was performed and the observations were tabulated.

Among the GLVs tested, *Coriandrum sativum* contained the highest amount of total chlorophyll. Next in the series were *Trigonella foenum- graecum,* closely followed by *Amaranthus tricolor, Mentha arvensis, Chenopodium album* and *Alternanthera sp.* The least chlorophyll content (among the tested GLVs) was observed in *Brassica oleracea var. capitata,* followed by *Allium cepa.*

The highest value of the ratio is reported in *Amaranthus tricolor* followed by *Brassica oleracea var. botrytis* indicating presence of large amount of chlorophyll in them. We can say that the leafy vegetables analysed in our study are the crops with a relatively high content of chlorophylls, similar to studies of Kopsell et al.2004. (Znidarcic et al.2011)

CONCLUSION

To maximize the chlorophyll intake in the body, one should wisely make use of available vegetables. A vegetable like broccoli—while richly green on the outside—tends to become more whitish toward the center of the stalk, and on a cup-for-cup basis, can be a less concentrated source of chlorophyll than a green leafy vegetable, which is not only thinner but also green "through and through."

As from the above result Coriandrum sativum and Mentha arvensis contain more chlorophyll, therefore, though as condiments, their small but frequent use would be beneficial for health. At the same time the other above mentioned GLVs are recommended to be added to regular meals, in abundance.

ACKNOWLEDGEMENT

The first author is thankful to UGC-CRO (Bhopal) for providing the financial support to undertake the work.

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