ISSN: 2394-1391

Indian Journal of Biology
Volume 3 Number 1, January - June 2016
DOI: http://dx.doi.org/10.21088/ijb.2394.1391.3116.1

Original Article

Biochemical, Nutritive and Cooking Quality of Edible Green Leaf – *Alternanthera Sessilis* (L.) R.Br. Ex Dc

Anitha T.*, Mary Josephine R.*

Abstract

Green leafy vegetables are important protective foods and highly beneficial for the maintenance of health and prevention of diseases. Green leafy vegetables are valuable in maintaining alkaline reserve in the body and are valued mainly for their high vitamin, dietary fibre and mineral contents. Dry leaf extract of *Alternanthera sessilis* (L.) R.Br. ex DC. was evaluated for biochemical compositions like total carbohydrate, starch, proteins, aminoacids, Vitamin B1 and Vitamin B2. The cooking qualities were also analyzed for total carbohydrate, starch and proteins at different intervals of time. The biochemical compositions obtained suggest that the leaves, as a cheap source and can be incorporated into human diet to meet the recommended daily allowances.

Keywords: Biochemical; Mineral; Green Leaf.

Introduction

Most developing countries depend on starch-based food as the main staple food for the supply of both energy and protein. India being blessed with a variety of natural surrounding and varying climates and seasons has a number of edible green leafy vegetables. Green leafy vegetables are an important component of the human diet, providing fiber, minerals and vitamins (Acikgoz, 2011; Emebu and Anyika, 2011). Green leafy vegetables are rich sources of vitamins such as â- carotene, ascorbic acid, riboflavin and folic acid as well as minerals such as iron, calcium and phosphorous. They are also recognized for their characteristic color, flavor and therapeutic value. Green leafy vegetables are important protective foods and highly beneficial for the maintenance of health and prevention of diseases. Recognizing the need for identification of such green leafy vegetables, which are believed to be nutritious, may help in achieving nutritional security. The diet and the food based approach in combating micronutrient malnutrition are essential for its role in increasing the availability and consumption of micronutrient rich foods. Green leafy vegetables are important component of the dietary regime of humans because they provide the necessary vitamins and minerals (Fasuyi, 2006). The awareness of the popularity on the significance of nutrition in health has resulted to an increasing quest for biochemical knowledge of composition of foods.

Author's Affiliation: *Department of Botany, Nirmala College for Women, Coimbatore, Tamilnadu, India.

Reprint's Request: Anitha T., Department of Botany, Nirmala College for Women, Coimbatore, Tamilnadu, India.
E-mail: tanitha101982@yahoo.com

Alternanthera sessilis (L.) R.Br. ex DC. (Plate - 1)

Taxonomic Position

Division	:	Magnoliphyta
Class	:	Magnolipsida
Order	:	Caryophyllales
Family	:	Amaranthaceae
Genus	:	Alternanthera
Species	:	*Alternanthera sessilis* (L.) R.Br. ex DC.

Alternanthera sessilis (Plate 1) is an aquatic plant known by several common names, including **sessile joyweed** and **dwarf copperleaf**. It is used as an aquarium plant. The plant occurs around the world. This is a perennial herb with prostrate stems, rarely ascending, often rooting at the nodes. Leaves obovate to broadly elliptic, occasionally linear-lanceolate, 1-

15 cm long, 0.3-3 cm wide, glabrous to sparsely villous and petioles 1-5 mm long. Flowers in sessile spikes, bract and bracteoles shiny white, 0.7-1.5 mm long, glabrous, sepals equal, 2.5-3 mm long, outer ones 1-nerved or indistinctly 3-nerved toward base, stamens 5, 2 sterile. The leaves are used as a vegetable. Young shoots and leaves are eaten as a vegetable in Southeast Asia. Occasionally it is cultivated for food or for use in herbal medicines.

The present study was undertaken with the aim to evaluate the biochemical, nutritive and cooking quality of green leafy vegetable, *Alternanthera sessilis* (L.) R.Br. ex DC.

The result of our study can be used as a fundamental data for dietary recommendation to help the consumer to select appropriate cooking time to meet their nutrient and health needs.

Materials and Methods

Collection and Preparation of Sample

The green leaves of *Alternanthera sessilis* were harvested. The leaves were destalked, washed and shade dried to avoid destroying active compounds. The dried leaves were then ground to homogenous powder using willey mill grinder and then stored in a air tight container for further analysis. The sample was then subject to biochemical analysis.

Biochemical Analysis

Biochemical analysis were carried out to find total Carbohydrate, Starch, Protein, Aminoacid, Vitamin B1 and Vitamin B2 according to the procedure of Association of Official Analytical Chemist (Sadasivam and Manickam, 1992). The cooking quality was analyzed for total Carbohydrate, Starch and Proteins.

Results and Discussion

Total Carbohydrate and starch was found to be 3.60 g/100g and 3.24 g/100g (Table 1) in *Alternanthera sessilis* leaves. It has been recommended that carbohydrate in the diet be 55-65% of total energy with emphasis on complex carbohydrate. 40gm of dietary fibre in the daily adult diet is recommended (FAO/WHO, 1998). Carbohydrate and starch has been found to be a poor source in this leaf. Protein is the most important constituent of food since it is required for general growth, maintenance and repair of body tissues. Protein and aminoacid was found to be 0.74 g/100g and 0.225 mg/100g (Table 1) in *Alternanthera sessilis* leaves. For maintenance of nitrogen balance, the minimum protein requirement is 0.51- 0.66g per kg body weight. ICMR has recommended an allowance of 1.0 g per Kg for adults. The requirement for infants and children is 1.5-2.0 g/ Kg. During pregnancy and lactation an additional 10-20g protein is recommended. The amount of Vitamin B1 (Thiamin) was found to be 2.76 mg/100gm (Table 1) in *Alternanthera sessilis* leaf. It acts as a co-enzyme in the carboxylation and transamination reactions in carbohydrate, protein and fat metabolism. The requirement is based on the total energy requirement, composition of diet and cooking losses. The recommended dietary allowances is 0.5 mg thiamin per 1000 kcal of diet. Vitamin B2 (Riboflavin) was found to be 12.64 mg/100g (Table 1) in *Alternanthera sessilis* leaves. It is a constituent of enzymes and amino acid oxidases that is required for oxidation of purines and amino acids. Intake of 0.6 mg of riboflavin per 1000 kcal is recommended for adults. The leaves were rich in vitamins and can be

Plate 1: *Alternanthera sessilis* (L.) R.Br. ex DC.

Table 1: Biochemical composition of *Alternanthera sessilis* (L.) R.Br. ex DC.

Parameters	Composition
Total soluble carbohydrate	3.60 g/100g
Starch	3.24 g/100g
Protein	0.74 g/100g
Aminoacid	0.225 mg/100g
Vitamin B1	2.76 mg/100gm
Vitamin B2	12.64 mg/100gm

Table 2: Change in Biochemical composition of *Alternanthera sessilis* (L.) R.Br. ex DC.
leaf based on different cooking time intervals (g/100gm)

Parametres	Different cooking time intervals g/100g			
	0 min	5 min	10 min	15 min
Carbohydrate	3.60	3.60	3.10	0.60
Starch	3.24	3.24	2.79	0.54
Protein	0.740	0.375	0.210	0.260

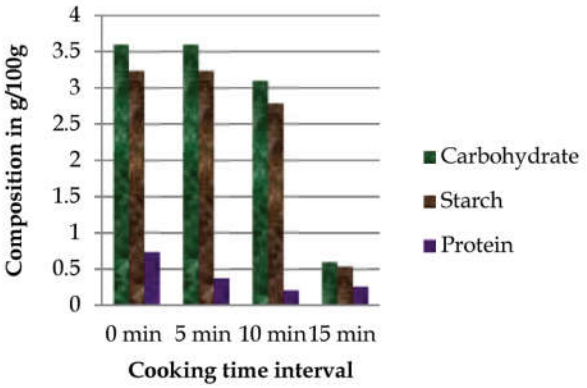

Chart 1: Chart showing Biochemical composition of *Alternanthera sessilis* (L.) R.Br. ex DC. leaf based on different cooking time intervals. (g/100gm)

added along with food.

The biochemical composition of *Alternanthera sessilis* leaves based on cooking time interval of 0 min, 5min, 10min and 15min (Table 2 and Chart 1) revealed that there was a gradual decrease in the composition of Carbohydrate and Starch. The composition of proteins remained approximately the same. Hence *Alternanthera sessilis* leaves can be recommended to be cooked in an average of 5 – 10 min.

References

1. Acikgoz, F E. Mineral, vitamin C and crude protein contents *Brassica oleraceae* var. acephala) at different harvesting stages. *African Journal of Biotechnology*. 2011; 10(75): 7170-17174, ISSN 1684– 5315.
2. Emebu, P K and Anyika, J U. Proximate and mineral composition *Brassica oleracea* grown in Delta State, Nigeria. *Pakistan Journal of Nutrition*. 2011; 10 (2): 190-194, ISSN 1680 – 5194.
3. FAO/WHO. Carbohydrate in Human Nutrition. Report of a Joint Expert FAO/WHO Consultation. FAO Food and Nutriton Paper 66. Food and Agriculture Organization, Rome. 1998; pp. 140.
4. Fasuyi, A O. Nutritional potentials of some tropical vegetable leaf meals,Chemical characterization and functional properties. *African Journal of Biotechnology*. 2006; 5: 49-53, ISSN 1684 – 5315.
5. Sadasivam, S and Manickam, A. *Biochemical methods for agricultural sciences*, 1992; ISBN 81-224-0388-3.