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PROXIMATE ANALYSIS OF *LEPIDIUM SATIVUM* LEAVES

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ABSTRACT

Proximate analysis of Lepidium Sativum leaves was carried out. The leaves were analyzed using standard procedures and the following results were obtained; moisture (81.85±0.85%), crude protein (5.82±0.07%), fiber (8.69±0.01%), and appreciable percentage of lipid (1.01±0.01%), Ash (3.25±0.03%) and Carbohydrate (8.08±0.02%). The result indicated that lepidium sativum have high amounts of proteins, fats and fiber. Therefore, this plant is recommended for consumers as vegetable in their diet so as to meet up the body nutrients demand.

***Keywords*:** Proximate analysis*, Lepidium sativum,*

INTRODUCTION

The common names of this plant are garden cress, cress, pepper weed garden, curled grass and peppergrass. It belongs to the family *Cruciferae* and genus *Lepidium* and specie *Sativum*. Garden cress is an important green vegetable consumed by human beings, most typically as a leafy vegetable or as a garnish. The young leaves are eaten raw or cooked. The fresh or dried sea pods can be used as a pungent seasoning (Facciola, 1990). Edible oil is obtained from the seed (Tanaka, 1976). Due to of the number of people eating the leaves, this work was carried out to ascertain the nutritional benefits involved.

It is an easily grown plant that succeeds in most soils (Larcom, 1980). For the best results however, it requires a moist soil and shade during summer seasons to prevent it running straight to seed (Vilmorin, 2004). A very easy and fast crop, it can be ready within 7-14 days from sowing the seed. It can also be grown outdoors as full-grown plant and can provide fresh leaves for the salad bowl all year round from seasonal sowing. The plant can be over wintered outdoors to provide edible leaves all year round, though they will require some protection if temperatures fall below -5^{0}C (Huxley, 1992). The plant is cultivated in most African countries and Asia (Facciola, 1990).

MATERIALS AND METHODS

Throughout the study, AnalaR reagents and deionized water were used. Glasswares and plastic containers were washed with detergents and later rinsed with tap water and finally with deionized water.

Sampling

The plant samples were collected from Bagwai local Government of Kano state. The samples were authenticated at the International Institute of Tropical Agriculture (IITA), Kano. The leaves were washed with water then dried in a ventilated room, away from dust and direct sunlight.

Sample Treatment

The leaves were ground into fine powder using pestle and mortar, and sieved through 20mm-mesh sieve. The dried powdered sample was used for the analysis. For moisture content however, fresh leaves were used.

Ash content was determined by incineration of 10g sample in a furnace at 600^{0}C for 8hrs and was ashed to constant weight. Each ash sample was dissolved in 10cm^3 6M nitric acid in 100cm^3 volumetric flask and made up to mark with water. The sample solution was kept in plastic labeled containers for analysis.

The recommended methods of the Association of Official Analytical Chemist (AOAC, 1990) were used for the determination of moisture, ash, crude lipid, crude fiber and nitrogen contents.

For moisture content, fresh leaves of the sample in triplicate were weighed in Petri dishes and dried in an oven at 105^{0}C for 24 hrs. The percentage loss in weight was expressed as percentage moisture content. A similar determination was carried out on dry sample so as to evaluate the residual moisture content.

The nitrogen content of the powdered leaves was used as an index of the protein termed 'crude protein' as distinct from true protein. The crude protein (CP) content was calculated from the nitrogen determined by Kjedahl method (Pearson, 1999).

In the method, all the nitrogen present in the sample was converted to ammonia by digesting the sample with sulphuric acid, (H_2SO_4). Sodium hydroxide, (NaOH) was then added to the digest to liberate the ammonia, which was distilled off, and collected in standard acid.

The quantity so collected was determined by titration. It was assumed that the nitrogen was derived from protein containing the percent nitrogen, and multiplying the nitrogen figure by 6.25; an approximate protein value was obtained.

This is the continuous extraction of fat content from the known weight of the powdered sample with petroleum ether (40-60^{0}C) in a soxhlet extractor. The residue after evaporation of the solvent was then weighed and the lipid content determined.

Carbohydrate content was determined by what is known as 'estimation by difference', where the sum of the moisture, ash, protein and lipid contents were subtracted from one hundred (100).

The crude fiber was determined by subjecting the residual powdered sample from ether extraction to successive treatment with boiling 0.25M H_2SO_4 acid and 0.312M NaOH, alkaline.

The insoluble residue was washed with hot water until it is base free. It was then dried to constant weight in an oven at 105^0C, cooled in a desiccator and weighed. The weighed sample was incinerated in a furnace at 550^0C for 2hrs until constant weight was obtained. The crude fiber was calculated as the loss in weight on ashing. The organic residue was the crude fiber.

RESULTS AND DISCUSSION

The results of the proximate analysis of the leaves of lepidium sativum are shown in Table 1. The leaves have high moisture content of 81.85±0.85%. The high moisture content obtained in this work is similar to the observation made by Larksome (1980). High moisture content aids microbial activities. Plants with low moisture content are easier to preserve.

Protein content of *lepidium sativum* was 5.82±0.07%, the result is in agreement with 5.8% reported (Hedrick, 1972) in a similar analysis. According to Pearson (1976), plant foods that contain more than 12% of its caloric value from protein are considered good source of protein. Therefore *L. sativum* is not a good source of protein, but it could still be use as supplements in protein deficient food.

Ash content in *L. sativum* was 3.25±0.03%. The ash content of a sample indicates its mineral content in biota. The values compared favorably with the values reported in some Nigerian leafy vegetables (Ifon and Bassir, 1980).

Crude lipid in the sample leave was 1.01±0.01. Tanaka (1976), reported crude lipid in the leaves of *L. sativum* as 1.00%. The result indicated that the leaves are poor source of plant lipid, which agrees with the general observation that leafy vegetables are low lipid containing food (Lintas, 1992). Carbohydrate is the principal constituent of all normal diet, providing most of the energy required. *L. sativum* was found to contain 8.08±0.02% carbohydrate. Facciola (1990) reported 8.7% carbohydrate in L. *sativum*.

Fibers are not digestible by human beings, so they are useless as foods (Oliver, 2002). The crude fiber result showed *L. sativum* to contain 8.69±0.01% fiber content. As an important part of any diet, fiber aids in digestion. An average adult is recommended to consume 18-32 grams of fiber daily (Ram, 1994).

Table 1: Proximate analysis result of *L. sativum* leaves in percentage (%).

Moisture	Protein	Ash	Lipid	Carbohydrate	Fiber
81.85	5.82	3.25	1.01	8.08	8.69

CONCLUSION

The result of this analysis showed that the leaves of *L. sativum* could be important green leafy vegetable as a source of nutrients to supplement other major sources. Based on these findings, it is recommended that children, pregnant and lactating mothers should continue to use the leaves to meet up the body nutrient demand.

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