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PROXIMATE ANALYSIS AND PHYTOCHEMICAL INVESTIGATION OF AQUEOUS LEAF EXTRACT OF LEPIDIUM *SATIVUM LINN*

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Abstract

Lepidium sativum is eaten as a vegetable plant. Its seed, root, and above ground parts are also used for medication. Garden cress also contains chemicals that might help fight some bacteria and viruses. Proximate analysis is very important because it provides respected information about the composition of food samples, which include crude fibre, crude lipid, crude protein ash, carbohydrate and moisture contents. This information is valuable in many aspects of the food industry, including product development, quality control, and regulatory purposes. This research work is aimed at proximate analysis and phytochemical analysis of *Lepidium sativum* leaves. The sample was collected in Sokoto Central Market, Sokoto State. Cold maceration method was used for extraction using aqueous solvent. Methods described by Association of Official and Analytical Chemist (AOAC) was used in carrying out this analysis. Results of nutritional investigation showed the content of Moisture (5.17±0.28 %), Ash (15.17±0.28 %), Crude lipid (2.83±0.40 %), Crude fibre (6.17±0.28 %), Crude protein (14.56±0.22 %) and Carbohydrate (61.28±0.38 %). The results of phyto-constituents showed that Saponins, Tannins, Alkaloids, Steroids, Flavonoids, Anthraquinones and Terpenoids were detected. The results of proximate analysis showed high content of protein which is play a role in development of our body diet. They also contain an element 'building blocks' known as amino acids which can be used as a source of energy. The results also showed high content of carbohydrate which is act as an energy source, help control blood glucose and insulin metabolism, participate in cholesterol and triglyceride metabolism, and help with fermentation.

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Keywords: Garden cress, Proximate analysis, Carbohydrate, Protein, Phytochemical

1. Introduction

Lepidium sativum Linn belong to family Cruciferae is an annual, glabrous, erect, and fast-growing, thyme is also called “garden cress or pepper weed”. This plant is found in Europe and southwestern Asia, Africa and many more [1-3]. The plant parts all have marketable value, the seeds and leaves were eaten as salad for tasty flavor [4, 5]. This valuable plant used as plasters for injuries [6] Seeds of this can be used in the treatment of breathing infections such as asthma [7-9] cough [7-9], blood loss [10], scorbutic illnesses [11], illness concerning liver [12-18], Treatment of syphilis and emotion of partial defecation, can be cured by root of this plant [19]. Previous phytochemical results showed that the seeds (fresh) are rich nutritional values [20-23]. The plant has

many pharmacological activities like antiseptic [6, 24-31], cancer protection [32-39], swelling [6, 30, 40-45], heart diseases, protection against free radicals [11, 30, 46-51], protection against lipoproteins [16, 17, 40, 52-58], removal of salt from the body [59-61], protection against gastric mucosa [62-67], stomach illness [62, 64, 65, 68], fasten gastrointestinal track [62-67], and action against constipation [67] and other pharmacological actions. The best season for cultivating of this plant is winter.

The plant is used traditionally to cure many illnesses such as cold mixture of seed can cure cough, liver diseases, diarrhea, dysentery, dyspepsia, bone illness, low blood and faintness [70-72]. Seeds of the plant were suggested as energizer; avoid loss of hair and inspiring the hungriness [73].

2.0 MATERIALS AND METHODS

2.1 Materials

Recommended analytical chemicals and reagents were used.

2.2 Methodology

2.2.1 Sample Collection and Identification.

The fresh and healthy leaves of the plant lepidium sativum were collected from Sokoto Central Market, Sokoto State. Identification and authentication of the sample was done at the Department of Plant Science and Biotechnology Kebbi State University of Science and Technology, Aliero, and deposited in the laboratory.

2.2.2 Preparation of Sample

The healthy leaves of lepidium sativumwashed carefully with hygienic water, dried at room temperature. Wooden pestle and mortar was used to achieve a fine powder and sieved using plastic sieve of (2 mm). The fine powder sample (50 g) was wrapped in a nylon bag at the laboratory until required for analysis. Maceration was the method of extraction using water as solvent.

2.2.3 Phytochemical Screening

The phytochemical analysis conducted using methods carried out by [75-76].

2.2.4 Nutritional Investigation

The nutritional composition of plant sample was carried out using method determined by [74].

2.2.5 Statistical Examination

Statistical Package for Social Sciences (SPSS) was used to determined nutritional composition of the plant sample.

3.0 Result and Discussion

3.1 Results

Phyto-constituents result indicated the presence of terpenoid, saponins, tannins, steroids, flavonoids,

alkaloids and anthraquinones.

Table 1: Phytochemical analysis of Lepidium sativum Leaves

Phytochemicals	Grades
Terpenoids	+
Saponins	+
Tannins	+
Steroids	+
Flavonoids	+
Alkaloids	+
Anthraquinones	+

Key: + present

Nutritional composition of the Lepidium sativum leaves showed the contents of moisture (5.17±0.28 %), ash (15.17±0.28 %), crude lipid (2.83±0.40 %), crude fibre (6.17±0.28 %), crude protein (14.56±0.22 %) and carbohydrate (61.28±0.38 %).

Table 2. Proximate analysis of Lepidium sativum Leaves.

Parameters	Results
% of Moisture	5.17±0.28
% of Ash	15.17±0.28
% of Crude lipid	2.83±0.40
% of Crude fibre	6.17±0.28
% of Crude protein	14.56±0.22
% of Carbohydrate	61.28±0.38

Results were recorded as mean ± standard deviation

3.2 Discussion

Phyto-constituent result indicated the presence of terpenoids, saponins, tannins, steroids, flavonoids, alkaloids, and anthraquinones. Saponins prevent the development of tumor, increase resistant and energy, lesser lipid, prevent swelling, antibiotic, [77-78] and have haemolytic action [79]. Tannins have ability cured skin diseases [80]. Alkaloids can serve as pain killer, used for the treatment of fever [81]. Steroids play a major role in sexual hormones [82]. Flavonoids serve as antioxidants [83]. Terpenes serve as anticancer [84]. Anthraquinones can act as waste removal from the body [85], anti-inflammatory [86] and many other pharmacological activities.

The nutritional values indicated vital suggestion concerning storing and value of the plant leaves. Moisture content was found to be 5.17±0.28 % which is in agreement with the result reported by [87] 5.83±0.28 %. The moisture content of this plant is low; hence the plant leaves may not be easily attacked by microorganism. The ash content was found to be 15.17±0.28 % which is higher than the result reported by [88] 15.38±0.21 %. Ash content indicated that the plant contains appreciable amount of minerals in the plant leaves. The Crude lipid content of the plant leaves was found to be 2.83±0.40 % which is slightly higher than that reported by [89] 1.72±0.18 %. Lipid promotes fat soluble vitamin absorption and can contribute energy content of diets. The result of crude fibre was found to contain 6.17±0.28 % which is in agreement with the result reported by [90] 6.75±1.02 %. The content of crude fibre is mainly used to retain inner distention for suitable peristaltic measure of the intestinal region. Crude protein was found to be 14.56±0.22 % which is lower than that reported by [90] 24.18±1.54 %. The content of carbohydrate was found to be 61.28±0.38 % which is higher compared to the one reported by [90] 32.87±0.29 %. High amount of
carbohydrate can act as important reserves and substrates for respiration.

4. Conclusion

The phyto-constituents and nutritional value of Lepidium sativum were analyzed in this research work. This finding showed the leaves may play a major role as important source of mineral, energy and proteins which might be due to the presence of bioactive composites.

These results permit additional study for the possible defensive properties to biological and long-lasting viruses and ought to be additionally examined as motivating constituents for new useful food originations.

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