Research Article

Preliminary Phytochemical Analysis and Estimation of Total Phenol Content in Carrot Extract

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ABSTRACT

The ingestion of natural antioxidants has been associated with reduced risk of cancer, cardiovascular diseases, diabetes, and other diseases associated with ageing and in recent years, there has been a worldwide treat drug towards the use of natural phytochemicals present in berry crops, teas, herbs, oilseeds, beans, fruits and vegetables. Medicinal plants contain some organic compounds which produce definite physiological action on the human body and these bioactive substances include tannins, alkaloids, carbohydrates, terpenoids and flavonoids. Phytochemical analysis refers to the extraction, screening and identification of the active substances that are present in a plant. The phytochemical screening of the extracts was first performed to detect the major chemical groups occurring in the extracts. Some of the bioactive substances that can be derived from plants or herbs are flavonoids, carotenoids, tannin, antioxidants and phenolic compounds.

Keywords: preliminary phytochemical analysis, carrot extract.

INTRODUCTION

Plant such as herb have long been used in traditional/ folk medicine in various cultures throughout the world[1]. Despite the great advances in modern medicine in recent decades, plants still make an important contribution to health care[2]. The ingestion of natural antioxidants has been associated with reduced risk of cancer, cardiovascular diseases, diabetes, and other diseases associated with ageing and in recent years, there has been a world-wide treat drug towards the use of natural phytochemicals present in berry crops, teas, herbs, oilseeds, beans, fruits and vegetables[3]. Medicinal plants contain some organic compounds which produce definite physiological action on the human body and these bioactive substances include tannins, alkaloids, carbohydrates, terpenoids and flavonoids. Phytochemical analysis refers to the extraction, screening and identification of the active substances that are present in a plant. The phytochemical screening of the extracts was first performed to detect the major chemical groups occurring in the extracts[5]. Some of the bioactive substances that can be derived from plants or herbs are flavonoids, carotenoids, tannin, antioxidants and phenolic compounds.

Although the knowledge of how these substances provide medicinal value to humans reflects a relatively scientific understanding, the use of plants and plant extract to heal, relieve pain and promotes good health dates back to before the beginnings of medical science. In the recent years, many plants species do have been scientifically evaluated for their possible medical applications. Fruits and vegetables are valuable sources of health- promoting substances active in neutralisation of reactive oxygen species[6]. Phytochemicals are primary and secondary metabolites which are naturally occurring in the leaves, vegetables and roots that have defence mechanisms and protect from various diseases. Primary metabolites are proteins, carbohydrates, chlorophyll, lipids and common sugars which are synthesised during photosynthesis and these organic compounds are essentials for plant life and growth and development. Secondary metabolites area tannins, flavonoids, phenolic, saponins and alkaloids which are synthesised by the plant during development and are time, tissue and organ specific.

Preliminary Phytochemical Screening

The extracts were subjected to phytochemical screening to test presence of metabolites such as flavonoids, phenol, tannins, saponins, reducing sugar, glycosides, terpenoids, anthraquinone, phylobatanins, starch and steroid were qualitatively analysed.[7]Major sources of flavonoids and phenolic are fruits and vegetables[8].

Carrots are one of the most widely used and enjoyed vegetables in the world, partly because they grow relatively easily, and are very versatile in a number of dishes and cultural cuisines. Carrots are scientifically classified as Daucuscarota and it is categorised as a root vegetable. They contain many medicinal and health benefits, and not to mention the taste which makes it an important vegetable in cultural cuisines across the globe.

Most of the benefits of carrots can be attributed to their beta-carotene and fibre content. This root vegetable is also a good source of antioxidant agents. Furthermore,

carrots are rich in vitamin A, Vitamin C, Vitamin K, vitamin B8, pantothenic acid, folate, potassium, iron, copper, and manganese. Carrots contain just 44 calories per 100gm.

There are a lot of health benefits which include prevention of heart diseases, property of reducing cholesterol, blood pressure, immune booster, digestion, prevents cancer, macular degeneration, improves eyesight and many other benefits.

The total phenolic content was determined using Folien-ciocalteu reagent as described by salar. Phenolic compounds are very important plant constituents because of their hydroxyl groups confer scavenging ability[9]. The amount of total phenolic content was calculated by Gallic equivalent from the standard calibration curve of Gallic acid and expressed as my Gallic equivalents /g dry weight basis.

MATERIALS AND METHODS

The present study preliminary phytochemical analysis and estimation of total phenolic content included carrot. The medicinal plant was collected locally and was used for a purpose for their phytochemical analysis. The chemicals which were used in this study we're Fehlings solution A and Fehlings solution B, distilled water, ethanol, methanol, aqueous HCL, chloroform, Sulphuric acid, ammonium solution, picric acid and hexane.

The leaves, the selected plant were removed from the plant and then washed under running tap water to remove any dust and dirt. The plant samples were then air dried for a flew days and the leaves were crushed into powder and stored in polythene bags for use. The powder of the plant was the taken in a test tube and distilled water was added to it and was shaken well. The solution was then filtered and the filtrate was then used for further phytochemical analysis. This filtrate was later used to test phylobatanins, reducing sugar, terpenoids, flavonoids and alkaloids.

For finding the total phenolic content the reagent Folien-Ciocalteau was used.

Test for Phylobatannins

Plant powder sample was mixed with distilled water in a test tube, then skate it well and filtered to take the plant extract. Then to the plant extract, 1% aqueous hydrochloric acid was added and the sample was then boiled with the help of hot plate stirrer. Formations of red coloured precipitate confirmed a positive result.

Test for Reducing Sugar

An amount of 0.50g of carrot was added in 5 ml of distilled water. Then 1 ml of ethanol mixed in plant extract. After that we took 1 ml of Fehlings solution A and 1 ml of Fehlings solution B in a test tube, heated it to boiling and then poured it in the aqueous ethanol extract. When colour reaction was observed, it shows a positive result.

Test for Terpenoids

An amount of 0.8 g of selected plant sample was taken in a test tube then poured 10 ml of methanol in it. Shaken well and filtered to take 5 ml extract of plant sample. Then 2ml of chloroform were mixed in extract of sample and 3 ml of sulphuric acid were added in the sample extract. Formation of reddish brown colour indicates the presence of terpenoids in the sample.

Test for Flavonoids

For the confirmation of flavonoids in carrot, 0.5g of carrot extract were added in the test tube and 10 ml of distill water, 5ml of dilute ammonia solution were added to a portion of the aqueous filtrate of carrot extract followed by addition of 1 ml concentrate H_2SO_4. Indication of yellow colour shows the presence of flavonoids in carrot.

Test for Alkaloids

For the purpose of phytochemical analysis of carrot, 0.2 g of the sample were added in each test tube and 3 ml of hexane were mixed in it, shaken well and filtered. Then took 5 ml of 2% HCL and poured in a test tube having the mixture, filtered it and poured few drops of picric acid in a mixture. Formation of yellow colour precipitate indicated the presence of alkaloids. [10]

RESULTS AND DISCUSSION

Phytochemicals are increasing acceptor as health promoting and maintaining and repairing agents in cells, tissues or the whole human body. The phytochemicals that are frequently associated with human health are carotenoids, polyphenols and tocopherols.

This study has revealed the presence of phytochemicals considered as active medicinal chemical constituents. Important medicinal phytochemicals such as terpenoids, reducing sugar, flavonoids, alkaloids and phylobatannins were present in the sample.

The result of the phytochemical analysis shows that carrots are rich in at least one of alkaloids, flavonoids, terpenoids, reducing sugar and phylobatannins. Phytochemicals play a vital role against number of diseases such as asthma, arthritis, cancer etc. unlike pharmaceutical chemical these phytochemicals do not have any side effects.[11]

Table 1: Total amount of Phytochemicals Present.

Phytochemicals	Carrot Extract
Phylobatannins	+++
Reducing sugars	++
Flavonoids	++++
Alkaloids	+++
Terpenoids	+++

Table 2: Total Phenolic Content.

Total Phenolic Content	Extracts
95 mg/gm	Carrot extract

From the table above, it can be seen that, in carrots, the amount of flavonoids exceed the amount of all other phytochemicals. Whereas phylobatannins, alkaloids and terpenoids showed a moderate concentration.

The total phenol content calculated in carrots through this experiment is 95mg/gm of Gallic acid equivalents.

CONCLUSION

Phytochemical analysis showed the presence of reducing sugars, flavonoids, terpenoids, alkaloids, phylobatannins in the extract. They have rich antioxidant property which can combat various diseases. Further research is required to isolate the active principle and elaborate on its mechanism of action in health and disease.

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