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SHORT COMMUNICATION **OPEN ACCESS**

Phytochemical analysis of some vegetables and fruits

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ABSTRACT
Most important sources of phytochemicals are and vegetable and fruits. Phytochemicals plays a major important role in food as natural antimicrobial agents in food preservation and also in human diet. Phytochemicals are having a high antioxidant activity. Antimicrobials are the Secondary metabolites which are originated from plants contribute flavor to food either individually or jointly and also against food borne pathogens. Phytochemicals controls the growth of microorganisms including pathogens and prevents natural spoilage processes causing food safety issues. In food industry, the basic unprocessed materials, harvested plants and slaughtered animals are associated with microorganisms. As food cosumed by human beings undergoes several processing treatments, we have to understand the effect of phytochemical composition of food by such treatments.
KEYWORDS: *Phytochemicals, Alkaloids, Terpenoids, Flavonoids, Phenolic compounds, Carbohydrates.*

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INTRODUCTION

Chemical compounds which are produced by plants are called phytochemicals, which help plants to resist fungi, bacteria and virus infections. Some phytochemicals are also used as traditional medicine and poisons. Plants are the origin for Phytochemicals. Plants produce phytochemicals through primary or secondary metabolism. The biological activity of this phytochemical plays helps in growth of plants and also defense against pathogens, competitors, or predators. Generally these phytochemicals are used for research purpose rather than essential nutrients because there is no proper evidence on possible consequences of health has not been established yet. Under research phytochemicals are classified into major categories. They are carotenoids and polyphenols, which include phenolic acids, flavonoids, stilbenes or lignans. Based on similar chemical structure, flavonoids can be further divided into groups such as anthocyanins, flavones, flavanones, isoflavones, and flavanols. Flavanols are further divided as epicatechins and proanthocyanidins. In total, over 25,000 phytochemicals have been discovered, and in most cases, these phytochemicals are concentrated in colourful parts of the plants like fruits, vegetables, nuts, legumes, and whole grains. Phytochemists study phytochemicals by first extracting and isolating compounds from the origin plant, followed by defining their structure or testing in laboratory model systems, such as in vitro studies using cell lines or in vivo studies using laboratory animals [1-5].

Phytochemical, are now generally regarded as a nutrient group having approved health claims for reducing the risk of some types of cancer and coronary heart disease. Eating a diet high in fruits, vegetables, grains, legumes and plant-based beverages has long-term health benefits, but there is no evidence that taking dietary supplements of non-nutrient phytochemicals extracted from plants similarly benefits health [6-7]. Phytochemical supplements are neither recommended by health authorities for improving health nor approved by regulatory agencies for health claims on product labels. In the present investigation, to analyze phytochemicals in different vegetable and fruit samples.

MATERIAL AND METHODS

1. Plant collection:

Samples are collected from different areas of and identified. The sample of vegetables and fruits were selected on the basis of local use of these in regular diet.

2. Extraction:

The fresh fruits and vegetables were dried and shade for about three weeks and grind using a mixer to

acoarse powder. 100 gms of powdered material was Soxhlet extracted with different solvents like ethanol chloroform and aqueous (12hr each).All the extract was evaporated in vacuum under reduced pressure and store's in glass bottles and room temperature until screened.
Phytochemicals of these vegetables and fruits are carried by following methods:

TEST FOR PROTEINS:

Millions Test:-

To crude extract 2ml of Millions Reagents added, white precipitate appears which on gentle heating turns red confirms the presence of protein.

Ninhydrins test:

2ml of 0.2% solution of Ninhydrin is added to crude extract and boiled, appearance of violet colors indicates the presence of aminoacids and proteins.

Test for carbohydrates:

Fehling test:

Equal volume of Fehling's A & Fehling's B are mixed and add 2ml of this mixture was added to crude extract and gently test tube boiled. A brick red precipitate was observed at the bottom of test tube which indicates the presence of reducing sugars.

Benedict's test:

2ml of Benedict's reagent is mixed with crude extract and boiled, formation of a reddish brownprecipitate indicates the presence of carbohydrates.

Iodine test:

2 ml of iodine solution was mixed with crude extract, formation of dark blue or purple colorindicates the presence of carbohydrates

Test for phenols:

2 ml of 2% FeCl3 solution was added to crude extract. A blue green or black coloration indicates the presence of phenols.

Test for Alkakoid:

On a steam bath 3ml of aqueous extract was stirred with 3ml of 1% HCl solution.To the aboveextract Mayer's and Wagner's reagent were added. Turbidity of the resulting precipitate is an evidence for the presence of Alkakoid

Test for flavonoids:

To 3ml of aqueous extract 1ml of 10% of lead acetate solution was added. The formation of a yellow precipitate indicates the presence of flavoniods.

Test for terpenoids:

3 ml of organic extract was dissolved in 2ml of chloroform and evaporated to dryness. To this 2ml of concentrated sulphuric acid was added and then heated for about 2mins. Development of grayish color indicates the presence of Terpenoids.

RESULT AND DISCUSSION

phytochemical screening had shown the presence of Alkaloid, Terpenoids, Flavonoids,phenolic compounds, proteins and carbohydrates in this vegetables & fruit extracts the summary of the results are presented in table-1 & table-2.

TABLE: 1 PHYTOCHEMICAL CONSTITUENTs OF VEGETABLES STUDIED

S.NO	Vegetable	Protein	Carbohydrates	PHENOLIC COMPOUNDS	TERPENOIDS	FLAVINOIDS	ALKALOIDS
1.	Potato	+	+	+	+	+	+
2.	Spinach	+	+	+	+	+	-
3.	Brocolli	+	+	+	-	+	+
4.	Soyabean	+	+	+	+	+	+
5.	Mushroom	+	+	+	+	+	+

TABLE: 2 PHYTOCHEMICAL CONSTIUENTS OF FRUITS STUDIED.

S.NO.	FRUIT	PROTEIN	CARBOHYDRATES	PHENOLIC COMPOUNDS	TERPENOIDS	FLAVINIODS	ALKALOIDS
1.	Orange	+	+	+	+	+	-
2.	Almond	+	+	+	+	_	_
3.	Guava	+	+	+	+	+	+
4.	Banana	+	+	+	+	+	+
5.	Papaya	+	+	+	+	+	+

In this study samples species belonging to different families are collected. Alkaloids are the basic natural products which occur in plants. They generally found in the form of salt with organic acids. They are considered to be the most efficient therapeutic agent among plant substances. Purely synthesized alkaloid can be used as medicinal agents because of their analgesic and anti-bacterial properties [8-11].
Flavonoids are the phytochemical present in plants which possess many useful activities like anti-inflammatory, anti-bacterial and antioxidant. Terpenoids used as anti-microbial, anti-diarrheal agent [12, 13].

CONCLUSION

Mostly plants play a major role in traditional medicinal system to combat several diseases. Generally plants has many phytochemicals like Alkaloid Flavonoids, Terpenoids with specialized properties. The plants screened for phytochemical analysis seemed to have the potential to act as a source of useful drugs and also to improve health status of consumers that were assayed. Potentially a majority of phytochemicals which includes some of the vitamins, terpenoids, flavonoids,carotenoids, phytoestrogens, phenolics, minerals and antioxidants in plant materials are used in the food industry as microbial pathogen injuries of both fresh fruit and vegetables or alternative preservative agents for controlling postharvest physiological disorders. Many researchers have been focused on the protective nature of the natural phytochemical compounds against bacterial and fungal attacks. Due to their lower toxicity or non-toxicity, these natural compounds have become interesting not only for plant protection but also in the protection of animal and human health from bacterial and fungal diseases.

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CONFLICT OF INTERESTS:

Authors have declared that no conflict of interests exist.

AUTHORS CONTRIBUTION

This work was carried out in collaboration among all authors. Author KY Karuna planned the work and programmed, experimental part was carried out by Authors KYK , KS and KS Monitoring, execution of the work and recording the date. Authors KYK and KS collected the literature and assisted in bringing out the paper in the prescribed format. All authors read and approved the final manuscript

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