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"COMPARATIVE STUDY OF TANNIN CONTENT AND PERCENTAGE ANTIOXIDANT ACTIVITY IN EXTRACT OF JEERA, METHI, AJWAIN SEED"

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ABSTRACT

Trigonella foenum-graecum L. (Fenugreek) commonly known as methi (in Hindi) has been used as a culinary spice, a flavoring agent and as a medicinal plant from ancient time. Fenugreek seeds are rich with vitamin E. Fresh Fenugreek leaves are beneficial for indigestion, flatulence and in sluggish liver treatment. Cumin seeds contain numerous phytochemicals that are known to have antioxidant, carminative and antiflatulent properties. The cumin oils have high antioxidant activity due to presence of monoterpene alcohols, essential flavours, flavonoids and other poly-phenolic molecules. The study revealed that the ethanolic extract significantly increase in Tail-Flick Latency. The antioxidant and tannin content determined by titrimetric method. Which shows that Ajwain and Jeera have motre antioxidant content than other two sample. Antioxidant activity determine the quality of sample. It is responsible for prevention of free radical production. Which is also helpful in glowing skin, hair growth. It is also determine by tannin content in sample.Three different solvents are taken and compare the maximum extract of antioxidant and tannin content.

KEYWORDS: Cumin, Herb, Titration, ethanol, antioxidant.

INTRODUCTION

Trigonella foenum-graecum L. (Fenugreek) commonly known as methi (in Hindi) has been used as a culinary spice, a flavoring agent and as a medicinal plant from ancient time. Fenugreek is a leguminous, herbaceous, rainfed crop included among the seed spices is about

30-60 cm tall, leaflets are about 2-2.5 cm long, flowers are 1-2 cm long, axillary, sessile and cultivated throughout the country.

Scientific Classification

Kingdom: Plantae.

Division: Magnoliophyta.

Class: Magnoliopsidaa.

Order: Fabales.

Family: Fabaceae.

Genus: Trigonella.

Species: foenum-graecum.

Urotoxic Activity

Cyclophosphamide (CP) is commonly used as an anti-cancer drug which has toxic effect to its reactive metabolites. The study of toxicity caused by the exposure to CP and L-buthionine-SR-sulfoximine (BSO) by Fenugreek extract was evaluated by measuring lipid peroxidation (LPO) and anti-oxidants in urinary bladder in mice. Fenugreek, a medicinal herb, showed protective effect not only on LPO but also on the enzymatic.

Anti-oxidants

Cyclophosphamide treated animals showed a significant decrease in the activities of glutathione S-transferase (GST), glutathione reductase (GR), glutathione peroxidase (GP) and catalase (CAT) on respect to the controls. Pre-treated Fenugreek extract restored activities of all the enzymes and thus showed an overall protective effect on additive effect of CP and BSO (Bhatia et al., 2005).

Antioxidant Effect

Scientist evaluated that polyphenol-rich extract of Fenugreek seed have potential effect against hydrogen peroxide (H2O2) - induced oxidation in normal and diabetic human erythrocytes (RBCs) (Yadav et al., 2011).

Antimicrobial Activity

The leaf and seed extract with different organic solvents were found effective against various bacteria like Escherichia coli, Salmonella typhi and Staphylococus aureus and fungus like F.

oxysporum f. sp. lycopersici (FOL) and F. oxysporum f. sp. radicis-lycopersici (FORL) etc (Yadav et al.,2011 and Omezzine et al.,2014)..


Cuminum cyminum – A Popular Spice

Spices are an important bionutrients for both food ingredients and nutritional supplements. From ancient times, spices have been used as food additives to enhance the taste and be flavor of food. Apart from these uses, spices also have numerous medicinal properties and used to treat several disorders that form an important part of the Ayurvedic Pharmacopoeia (Indian System of Medicine). Spices have increasingly larger role to play in Indian recipes as the bactericidal, bacteriostatic, fungistatic, antifertility, antihelminthic and other medicinal properties and also believed to aid digestion. In the traditional Indian system of medicine, more than a few spices and herbs have hold and possess several medicinal properties such as antithrombotic, anti-atherosclerotic, hypolipidemic, antiinflammatory, anti-aggregatory, eicosanoid inhibitor.

The cumin seeds contain aldehyde (60%) fats, amino acids, flavonoids and glycosides (22%), volatile oil (2-5%) and the yellow colored fresh oil contains cuminaldehyde as its chief component. compounds occurring in cumin are cuminaldehyde, limonene, α- and β-pinene, 1, 8-cineole, o-and p-cymene, α- and γ–terpinene, safranal and linalool.

Antioxidant

The cumin oils have high antioxidant activity due to presence of monoterpene alcohols, essential flavours, flavonoids and other poly-phenolic molecules.

Antimicrobial

The antimicrobial action of cumin both oil and aqueous has assessed against a wide range of valuable and pathogenic gram-positive and gram-negative microbial strains. Cumin seed oil and alcoholic extract inhibited the growth of Klebsiella pneumoniae and its clinical isolates and caused improvement in cell morphology, capsule expression and decreased urease

activity. Cumin has also found the biofilm-formation preventive properties against Streptococcus mutans and Streptococcus pyogenes. Cumin has shown the anti-fungal activity against food, soil, animal and human pathogens, yeasts, aflatoxins and mycotoxin producers.

Antidiabetic

Oral administration of cumin showed hypoglycemic effect in normal rabbit, resulting in significant decrease in the area under the glucose tolerance curve hyperglycemic peak.81 The biologically active constituent cuminaldehyde inhibited aldose reductase and alpha glucosidase isolated from rat.In hyperlipidemia, when administered cumin by orally to alloxan induced iabetic rats, reduced the body weight, plasma and tissue cholesterol, phospholipids, free fatty acids and triglycerides and also decreased aspartate transaminase (AST), alkaline phosphatase (ALP) and γ-glutamyl transferase (GGT) activities and decreased the tissue (liver and kidney) levels of cholesterol, triglycerides and phospholipids.

Ajwain (Trachyspermum ammi)

Ajwain, Trachyspermum ammi (L.) Sprague is an annual herbaceous plant belonging to the highly valued medicinally important family, Apiaceae. It is said that the herb is widely grown in arid and semi-arid regions where the soil involve high amount of salts. A number of chemical constituents have been reported for the herb. Fiber (11.9%), carbohydrates (24.6%), tannins, glycosides, moisture (8.9%), protein (17.1%), fat (21.1%), saponins, flavones and other components (7.1%).

Antioxidant Properties

The antioxidant and ameliorative property of Ajwain extract has been evaluated on hexachlorocyclohexane induced oxidative stress and toxicity in an in vivo investigation.

Accordingly, results revealed that the dietary Ajwain extract would reduce the toxicity resulted from hepatic free radical stress.

Detoxification Activity

Detoxification of aflatoxins by seed extract of Ajwain can support the related traditional reports. Hence in an experimental study, Ajwain seed extract exhibited the maximum degradation of aflatoxin G1.

Anti-inflammatory Effects

Ajwain was also evaluated for exhibiting anti– inflammatory effect. Accordingly, both total alcoholic extract and total aqueous extract possess in vivo signi- ficant anti–inflammatory effect.

MATERIALS AND METHODS

Collection of seeds- Trachyspermum Ammi, Trigonella Foenum –Grecum,Cuminum Cyminum(A-Popular Spice) were collected from local area Around form Bhopal in the month of Sep.2018. The Material Was shade dried.

Sample Preparation

10g of the studied food product was extracted with distilled water and methanol into 250ml of volumetric during 24 hours at room temperature and then the sample was filtrated.

Preparation of 0.1 of $KMnO_4$;- weight 3.3g of KMno4 and dissolve into a 1000ml of dissttilled water in a beaker.

5.6 Extrction by digestion process in two solvents

1. Extract with distilled water
2. Extract with methnol.

1.Tannin extract with distilled water

- Firstly weigh the sample.
- Take a distilled water in a beaker and dissolve the sample in beaker.
- And leave the sample for 24 hours.
- After 24 hours sample was filter and tannin are obtain.

2.Tannin extract with methanol

- Firstly weight the sample.
- And take amethnol in a beaker and dissolve the sample in a beaker.
- And leave the sample fir 24 hours.
- After 24 hours sample was filter and tannin are obtain.

Fig no. 1: Ajwain and Methanol.

Fig no. 2: Jeera and methanol.

Fig no. 3: Methi and methanol.

Note- Same assembly is prepared for aqueous solvets of each sample.

5.7 preparation of 0.1 $KMnO_4$ solution.

Weight 3.3 of KMno4 and dissolve in 1liter of distilled and heat on water bath for 1 hours.

5.8 Standardization of 0.1 $KMnO_4$ solution

- Weight 200mg of sodium oxalate and dissolve in a 20ml of disttiled water.
- And add 2ml of sulfuric acid and heated 70°c
- After heating the sodium oxalate solution are standardization with 0.1N potassium per magnet solution. pink color was aaper.

- 11 **Tannis assay** ;- The analyses of tannins content in fruit and vegitables were performed according to the international pharmacopoeia AOAC method after some modifications. 25 ml of infusion are measured into 1 litre concal flask,then 25 ml of methylene blue solution and 750 ml of distilled water are added 0.1N aqueous solution of KMNO4 is used for titration until the blue coloured solution change. the blank test by titration a mixture of 25 ml of methylene blue solution and 750 ml distilled water are carried out.

- **2.4.5. Phosphomolybdate Assay for Total Antioxidant Capacity**

Total determine total antioxidant capacity (TAC) of A.caudatum extracts as per phosphomolubdate assay proposed by the procedure described by[24,25] was used with Slight modification. for sample preparation, 250 mg plant extract was dissolved in 1ml methanol and sonicated for 5 minute to get a homogenous mixture. Ascorbic acid was used us a standard. A stock solution of ascorbic acid (1000mg/L) was prepared in distilled water, form which dilutions were made ranging from 25mg/L to 500mg/L.

In a test tube 300µL plant extract was mixed with 3ml phosphomolybdate reagent (5 M sulfuric acid and 10 mM sodium phosphate and 10mM ammonium molybdate. The test tube was covered with aluminium foil and incubated at 95°C for 19 minutes. The mixture was then allowed to reach room temperature when its absorbs was recorded at 765 nm. blank was run using the sample procedure but containing a equal volume of methanol in place of the plant sample. The antioxidant capacity was reported µg of ascorbic acid equivalents (AAE) per ml.
% antioxidant activity= [(Ac-As)/ Ac]×100.

Where Ac and As are the absorbance of the control and sample, respectively. The control was prepared by adding 10µL of methanol in place of the sample.

RESULTS AND DISCUSSION

The antioxidant and tannin content determined by titrimetric method. Which shows that Ajwain and Jeera have motre antioxidant content than other two sample, in titrimetriic method potassium permagnate is taken as a standard solution which is it self a oxidizing agent. So the volume consumed by different different sample.

It is compare by the others sample. The more sample consume that means the more antioxidant property the sample have. which is shown in as follows.

- In aqueous extract of sample (Table no. 1)

S. No.	Sample Name	Volume consume of Potassium permagnate
1	METHI	1.2 ml
2	JEERA	3.5 ml
3	AJWAIN	4 ml

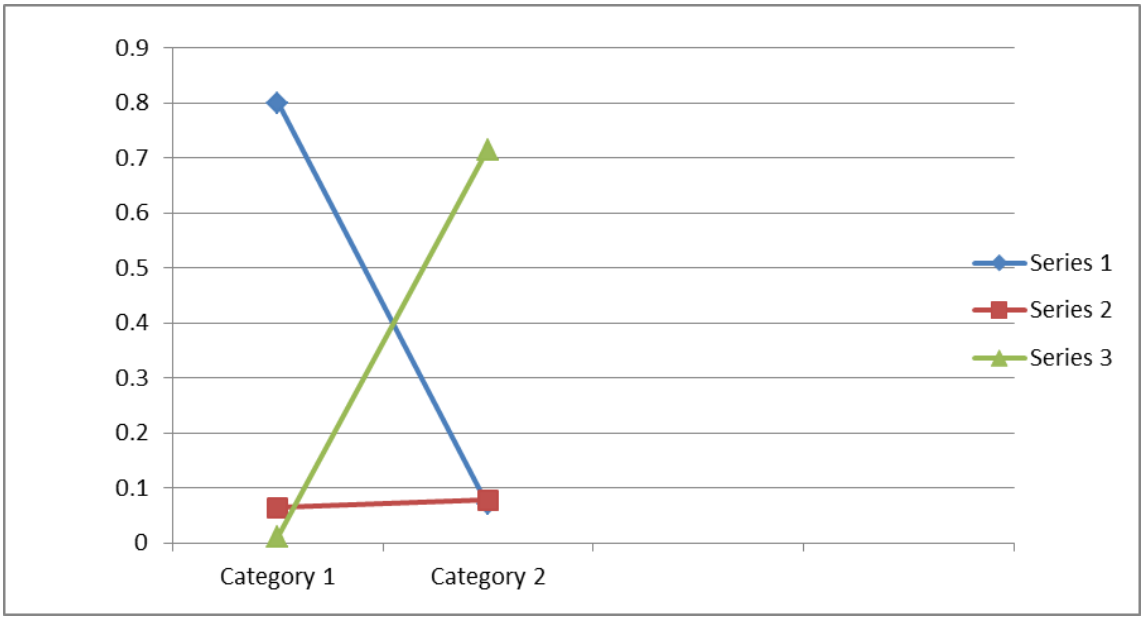
- In methanolic extract of sample (Table no.2)

S. No.	Sample Name	Volume consume of Potassium permagnate
1	METHI	0.3 ml
2	JEERA	1 ml
3	AJWAIN	2.9 ml

Antioxidant activity is also determined by Phosphomolybdate assay which is taken in both extract methanol and aqueous of each sample, it is compared by its absorbance taken at 765nm.

The absorbance is taken first blank solution distill water and methanol and done the baseline correction. So that solvent does not show its peak. It is comparerd and analyze the better antioxidant activity in the extract.

The absorbance shown in different solvent of each sample as follows.



Where as-

Series1 = methi, series2= jeera, series3= ajwain

Category1 = Aqueous extract of each sample

Category2= Methanolic extract of each sample

As graph shown that methi have more antioxidant than other two sample in aqueous extract. Which is very usefull in hair preparation, glowing of skin.

CONCLUSION

The study says that the percentage antioxidant content is determined by two different methods and comparing both results. The aqueous extract of Methi and Ajwain have more antioxidant property than other. Methanolic extract shows less results than aqueous extract

The cumin seeds contain aldehyde (60%) fats, amino acids, flavonoids and glycosides (22%), volatile oil (2-5%) and the yellow colored fresh oil contains cuminaldehyde as its chief component. compounds occurring in cumin are cuminaldehyde, limonene, α- and β-pinene, 1, 8-cineole, o-and p-cymene, α- and γ–terpinene, safranal and linalool.

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