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Comparison Of Phytochemical Content In Different Parts Of Onion (Allium Cepa)

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ABSTRACT :

The phytochemical screening reveals that all the three parts of Onion (Onion bulb, Onion peels and Onion roots) shows the presence of most of the phyto constituents. On comparison it was found that onion peels and onion roots also contain the phyto-constituents.

For Onion bulb, both methanol and acetone extract showed the presence of more phytoconstituents.For Onion peels, roots methanol extract showed the presence of more phytoconstituents.

Key words: Allium cepa, Bulb, phytocontituents ,comparison of extracts etc.

Introduction:

Onions *(Allium cepa)* possess strong characteristic aromas and flavors, which have made them important ingredients in food (Ly *et al.* 2005). It has been shown that bioactive compounds are present in every part of onion bulb (Benitez *et al.* 20ll). Onion is a potent cardiovascular and anticancer agent, with hypocholesterolemic, antioxidant, antiasthmatic and antithrombotic activity (Moreno *et al.* 2006). Onion is one of the major sorces of dietary flavonoids which contains anthocyanins, that is responsible for the red or purple color observed in some varieties, and flavonols (quercetin) thatmay contribute tothe production of yellow and brown compounds found in the skins of many onions. Quercetin has demonstrated antioxidant and free radical scavenging power and its capability to protect against cardiovascular disease (Bonaccorsi et al. 2008, Benitez et al. 2011).
Throughout the world, onions, or Allium cepa Linn, are used as a vegetable and seasoning in cooking. They are among the earliest cultivated plants in the Liliaceae family. In numerous regions of Africa, it is a crucial component. Although it is mostly manufactured in Egypt, Egypt is the nation that has grown the most abstinent. It has amino acid-containing sulphur in addition to a number of minerals, vitamins, and secondary metabolites such phenolic acids, flavonoids, thiosulfinates, saponins, and phytosterols. Onions have many other uses besides food, including being a source of several health advantages. The potential use of onions in the treatment of a variety of diseases is supported by their widely distributed pharmacological characteristics, which include their antibacterial, antidiabetic, anticancer, and antioxidant cardiovascular actions.

Materials and Methods :

Onion were collected from the local market of Bhiwandi,Maharashtra India

a) Test for Phenolic Compounds (ferric chloride test): To test the test solution, add few drops of neutral 5% ferric chloride solution. A dark green colour indicates the presence of phenolic compounds
b) Test for Flavonoids (Alkaline Reagent Test): 10 ml of each extract (separately) were treated with few drops of sodium hydroxide solution. Formation of intense yellow, which becomes colour less on addition of dilute acid, indicates the presence Flavonoids
c) Test for Glycosides: 1 ml of dye extract was added in glacial acetic acid with few drops of ferric chloride followed by adding concentrated sulphuric acid from the walls of the test tube. Appearance of the reddish brown at the junction of two layers and the bluish green colour in the upper layer indicated the presence of cardiac glycoside
d) Test for terpenoids: 1ml of extract was dissolved in 1ml of chloroform and 1ml of acetic anhydride was added following the addition of 2ml of concentrated sulphuric acid. Formation of reddish colour indicated the presence of terepenoids
e) Test for saponins (froth test): 5 ml of extract was boiled in 10 ml distilled water in a test tube and was shaken vigorously for about 30 seconds. The test tube was allowed to settle for half an hour, formation of froth indicated the presence of saponins.
f) Test for Tannins (lead acetate test): Few drops of 1% lead acetate were added to 5 ml of plant extract and appearance of yellow precipitate indicated the presence of tannins.
g) Test for alkaloids (Wagner's test): Alkaloids give reddish brown precipitate with Wagner's reagent. (Solution of iodine in potassium iodide).

h) Molisch's test The solution to be tested are mixed with a small amount of Molisch's reagent (alpha-naphthol dissolved in ethanol) in a test tube and mixed well. A small amount of concentrated sulphuric acid wasslowly added down the sides of the sloping test tube. Appearance of purple ring at the junction indicated the presence of carbohydrates.

i) Plebotannins test: Lead acetate test Small quantity of the sample solutions was dissolved in distilled water and 10% lead acetate solution was added to them, a white precipitate indicated the presence of phenolics and tannins.

j) Test for proteins Biuret test To 2 mLof the sample solutions, 5 drops of 1% coppersulphate solution are added followed by 2 mL of 10% NaOH. The contents are mixed thoroughly. Formation of a purple or violet colour confirmed the presence of proteins.

Result and Discussion :

Table 1.Phytochemical analysis of Onion bulb

SR NO.	Phytochemical components	Aqueous extract	Methanol extract	Acetone extract
l	PHENOL	-	-	-
2	FLAVONOID	+	+	+
3	CARDIOGLYCOSIDES	-	+	-
4	TRITERPENES	+	+	+
5	SAPONINS	-	-	-
6	TANNINS	-	-	-
7	CARBOHYDRATES	+	+	+
8	PHLOBATANNTNS	-	-	-
9	ALKALOIDS	-	-	-
10	STEROIDS	+	+	+
11	TERPENOIDS	+	+	+
12	FAT	+	+	+
13	REDUCING SUGAR	+	+	+
14	PROTEINS/AMINOACIDS	+	+	+

Table 2 Phytochemical analysis of Onion Peel

SR NO.	Phytochemical components	Aqueous extract	Methanol extract	Acetone extract
l	PHENOL	+	+	+
2	FLAVONOID	+	+	+
3	CARDIAC GLYCOSIDES	-	+	-

4	TRITERPENES	-	+	-
5	SAPONINS	+	+	-
6	TANNIS	+	+	+
7	CARBOHYDRATES	+	+	+
8	PHLOBATANNINS	-	-	-
9	ALKALOIDS	-	-	-
10	STEROIDS	+	+	+
11	TERPENOIDS	-	+	-
12	FAT	-	+	+
13	REDUCING SUGAR	+	+	+
14	PROTEINS/AMINO ACIDS	-	+	-

Table 3 Phytochemical analysis of Onion Root

SR NO.	Phytochemical components	Aqueous extract	Methanol extract	Acetone extract
1	PHENOL	-	-	-
2	FLAVONOID	+	+	+
3	CARDIAC GLYCOSIDES	-	-	+
4	TRITERPENES	-	+	+
5	SAPONINS	-	-	-
6	TANNIS	-	-	-
7	CARBOHYDRATES	+	+	+
8	PHLOBATANNINS	-	-	-
9	ALKALOIDS	-	-	-
10	STEROIDS	-	-	-
11	TERPENOIDS	-	+	+
12	FAT	-	+	-

13	REDUCINGSUGAR	-	-	-
14	PROTEINS/AMINO ACIDS	+	+	+

Phytochemical screening was carried out using different solvent system.The preliminary data on the constituents of different parts of Onion extracts were obtained. The result obtained from qualitative test for phytoconstituent is represented in table1,2, 3.

Three solvent systems were used for Onion bulb, peels and roots such as Acetone, Methanol and Distilled water.

Onion bulb: Aqueous extract shows the presence of flavonoids, triterpenes, carbohydrates, steroids, terpenoids, fats, reducing sugars and proteins/ amino acids.Methanolic extract shows the presence of flavonoids,cardiacglycosides,triterpenes, carbohydrates, steroids, terpenoids, fats, reducing sugars and proteins/amino acids.Acetone extract shows the presence of flavonoids, triterpenes, carbohydrates, alkaloids, steroids, terpenoids, fats, reducing sugars and proteins/ amino acids.

Onion peels: Aqueous extract shows the presence of phenols, flavonoids, saponins, tannins, carbohydrates, steroids and reducing sugars.Methanolic extract shows the presence of phenols,flavonoids, cardiac glycosides, triterpenes, saponins, tannins, carbohydrates,steroids, terpenoids, fats, reducing sugars and proteins/ amino acids.Acetone extract shows the presence of phenols, flavonoids, tannins, carbohydrates,steroids, fats and reducing sugars.

Onion root: Aqueous extract shows the presence of flavonoids,carbohydrates and proteins/aminoacids. Methanolic extract shows the presence of flavonoids, triterpenes, carbohydrates,terpenoids, fats and proteins/ amino acids. Acetone extract shows the presence of flavonoids, cardiac glycosides, triterpenes, carbohydrates, terpenoids and proteins/ amino acids.

On comparison between the three parts of Onion,it was found that Onion peels contains maximum phytochemicals.Different authors have linked the antimicrobial analysis of plants to the presence of phytochemicals. Nwadiaro and Nwachukwu (2007) linked the antimicrobial activity of plants to the presence of tannins, alkaloids, flavonoids and saponins. Also, qualitative phytochemical analysis of garlic and onions has been done by different researchers with positive results for different Phytoconstituents (Palve et al 2015)

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