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A COMPARATIVE STUDY OF CHEMICAL COMPOUNDS AND ANTI-BACTERIAL EFFICACY OF DIFFERENT ALLIUM CEPA PLANT EXTRACTS

Alaa F. Sulaiman[a], Wasan M. Alwan[b*], Samir A. Salman[c], Entisar E. Al-Abodi[d]

[a-d]Department Chemistry, College of Education for Pure Science / Ibn Al-Haitham, University of Baghdad/Iraq
Corresponding author: wasan.m.a@ihcoedu.uobaghdad.edu.iq

Abstract
This research considers the Allium cepa, as plants have effective antioxidant properties because they have many of active biocompounds. It exhibits that the cold, hot, and ethanolic extracts of Allium cepa, consist of the same effective molecules like tannins, saponines, flavonoids, glycosides, terpenoids, and also amino groups. The absence of the anthroquinones, alkaloids, and phlobatanins, are an evidence on the detection about this effective molecule neither dependent on the nature of extraction method or used solvent. The results exhibited the higher effeciency of hot extract of inhibition of (EC, *Escherichi coli*; STR, *Strptococus*; STA, *Staphylus*) bacteria growth compared with cold and ethanolic extracts.

Keywords: Allium cepa extracts, medicine plants, *Escherichi coli*, *Strptococus*, *Staphylus*, green chemistry, Phytochemical analysis.

Introduction

During a few years ago, the concepts of "green chemistry" were began, in which there initiated a turned away from chemical reagents (Rouhi.,2002). With these changes Evolved in the chemical industry since years ago, a set of 12 principles were advanced to summerize the concepts and results which resulting from "green strategies" (Anastas *et al*.,1998, Cordell *et al*.,2007). The study of the use of medicinal plants to treat ailments falls within the field of green chemistry. The most significint families of "medicinal plant species" are that of the Zingiberaceae, Lamiaceae, and Cupressaceae. The most important plants are Olea europaea, Allium Sativum, Zingiber officinale, Allium cepa, Eucalyptus globules, Thymus maroccanus, Curcuma xanthorrhiza, Foeniculum vulgare, Rosmarinus officinalis, Thymus satureioides, Phoenix dactylifera, Pimpinella anisum and Mentha pulegium (Reddy.,2017). According to many studies, these plants are used to treating several of respiratory diseases which causing signs and symptoms comparable to coronavirus signs and symptoms.

Allium cepa (the common name "onion") is one of the oldest plants which cultivated in worldwide (Gurushizde and Mashayekhi.,2007). several epidemiological research definition that eating of onions is correlated with a reduced risk of developing of cancer, neurodegenerative and cardiovascular diseases (Kendler.,1987, Nicastro *et al*.,2015, Yang *et al*.,2013). Their advantageuos effect on health is due to more contents of biologically effective phytomolecules, like phenolic molecules, "flavonoids", and many organosulfur molecules (Goldman *et al*.,1996, Bonaccorsi *et al*.,2008, Griffiths *et al*.,2002]. Also, they are a rich source of anthocyanins [Gennaro *et al*.,2002, Entisar *et al*.,2016, Esam *et al*.,2015). Structure of some important components of *Allium cepa* extracts shows in (Fredotovi´c *et al*.,2014). In this study, we identified and quantified major compounds present in the extract of *Allium cepa* and to assess the biological activity of these widely used plants.

Medical Herbal Extract

Plant specimen collection and processing:

The Allium cepa leaves are washed in bath water, then rinsed with purified water, and they are dried in an oven for 3 days at 308-313K. To achieve a driven shape, each plant's dried leaves are pulverized, using a sterile electric blender. This plants' powdered form is putted in hermetic glass containers and shielded from sunlight before the study is necessary.

Preparation of the extracts:

Macerate 500 g in 1500 ml of ethyl alcohol (70 percent v / v), with sometimes stirring, it was done during one week. The mixture was filtered, then purified and evaporated to an initial amount at 313K. By using a 313K solution, the rest was completely evaporated and placed in the desiccator for two days using a hot air oven.

The production of the powdered plant material (10 percent w / w) was collected and processed in air-tight containers without a low exposure to light at 278K. In the same way, a portion of the pulverized samples was collected with water for hot and cold extracts only, but with a 323K extraction, in the contrast of the hot and cold extracts' phytochemical constituents with ethanolic extract (cold extract yields 12%, and 15% w/w for hot extract).

Analysis Phytochemical

Chemical analyzes are conducted using traditional methods in the powdered form of a plant extract on the aqueous and ethic samples (Majaw and Moirangthem.,2009, Aja,2010). Consistency analysis of Photochemical Products. A sample of crude powder with 10 ml of ethyl acetate solution was heated by a steam bath for 3 min, then the mixture was filtered and 4 ml of the this solution shaken with 1 ml of dilute ammonium hydroxide, a yellow coloring was apeared (Flavonoid monitoring). 500 mg of coarse powder was shaken with D.W. and it was warmed in a water bath and the continue of froth which indicats the existence of saponins compound.

A 10 ml of D.W. was stirred with 500 mg of crude powder, then This solution was filtrated and added 0.1 percent of ferric chloride to the resulting filtrate, a blue-black colouring which indicats the existence of tannin compound. The filtering method was carried out in the form of 500 gm of crude powder with benzene (10 ml) and 0.5 ml of 10 percent

ammonium hydroxide solution was applied. In the layer stage the appearance of the violet ink indicates that the anthraquinones are present. 500 mg synthetic powder drained the 5 per cent ethyl ether for 15 min. The degraded sample of 5 ml HCl aqueous) (was put in a boiling bath of water for 20 minutes. The resulting blend was centrifuged for 10 minutes at 3000 rpm. A second one-ml of Dragendroff 's reagent and turbidity was treated with only a few drops of mayer reagent, 1000 ml of filtrate. Boiled a 1 percent aqueous hydrochloric acid (HCl) of each plant sample to screen red precipitate deposition (Phlobatannin test). A tube of each plant sample aqueous extract is mixed with 0.2 L and CHCl3, and 0.5 l. The combination is treated carefully to create a 0.3 l layer of concentrated H2SO4. A interface with a reddish brown colouration is produced when terpenoids are existence. 200

mg of the sample is combined with 30 ml of purified water, and it was heated on a water bath for 5 min and filtered and

used as: 0.2 ml of Fehling solution A and Fehling solution B is dissolved in 5 ml of filtrate before it became alkaline and then was heated for 2 min in a water bath. The lack of glycosides has been seen in lightly blue (instead of red brick precipitate).

Photochemical materials consistency analysis:

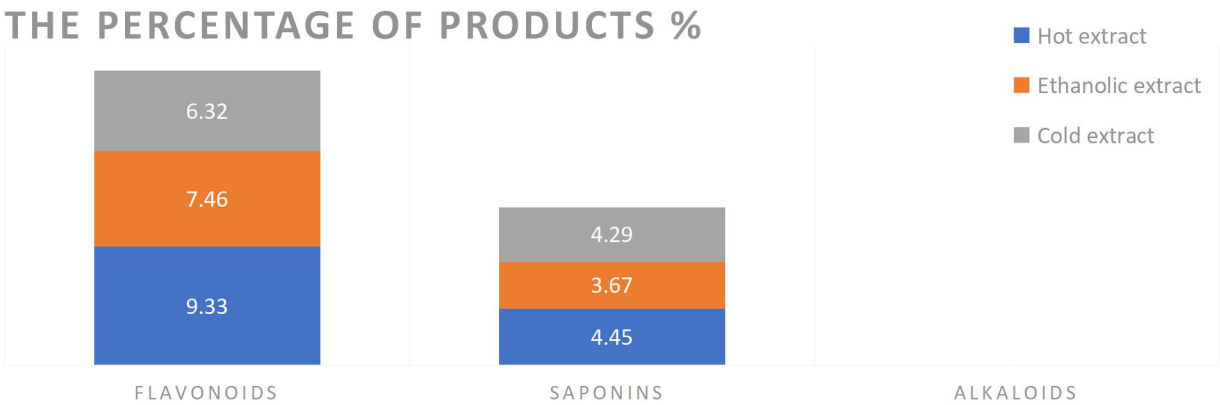
At room temperature, a repeated 0.1 l of 80 per cent aqueous methanol removed 10 g of each crude plant material. The entire solution was filtered. Afterwards the filtrate was putted at a crusher and evaporated into dryness. The conical flask was filled with 2000 mg of crude from each plant, and 20 per cent of the aqueous ethanol was added to 100 cm^3. The samples were cooked in a hot water bath for 4 hours with a constant ripple at about 55 ° C. In order to refine the blend and re-extract the oil, another 200 ml of 20 per cent ethyl alcohol was used. Together the extracts were reduced in the water bath by about 363K to 40 ml, then the concentrate was placed in 250 ml separating funnel and 20 ml diethyl ether, then shaken firmly. The aqueous layer was returned following elimination of the ether layer. Purification process was repeated. Fed n-butanol by 60 ml. The mixed n-butanol extracts are washed twice with 10 ml, 5 per cent of sodium chloride solution. The remainder were heated up in a moist shower, then the sample was dried to constant weight in the oven and measured the saponin content. The reference method used was to measure the content of chelidonin according to the German Pharmacopeia [Szentmih *et al*., 2003, Jirovetz *et al*.,2003) in order to determine the total alkaloid content of the plants and extracts.

Table.1. The Allium cepa extracts consistency.

Extraction test	Cold extract	Ethanolic extract	Hot extract
saponines	+ve	+ve	+ve
Tannins	+ve	+ve	+ve
Flavonoids	+ve	+ve	+ve
Terpenoids	+ve	+ve	+ve
Glycosides	+ve	+ve	+ve
Amino acids or primary and secondary amine	+ve	+ve	+ve
Alkaloids	-ve	-ve	-ve
phlobatannins	-ve	-ve	-ve
Anthroquinones	-ve	-ve	-ve

Fig. 1. The Allium cepa extracts consistency.

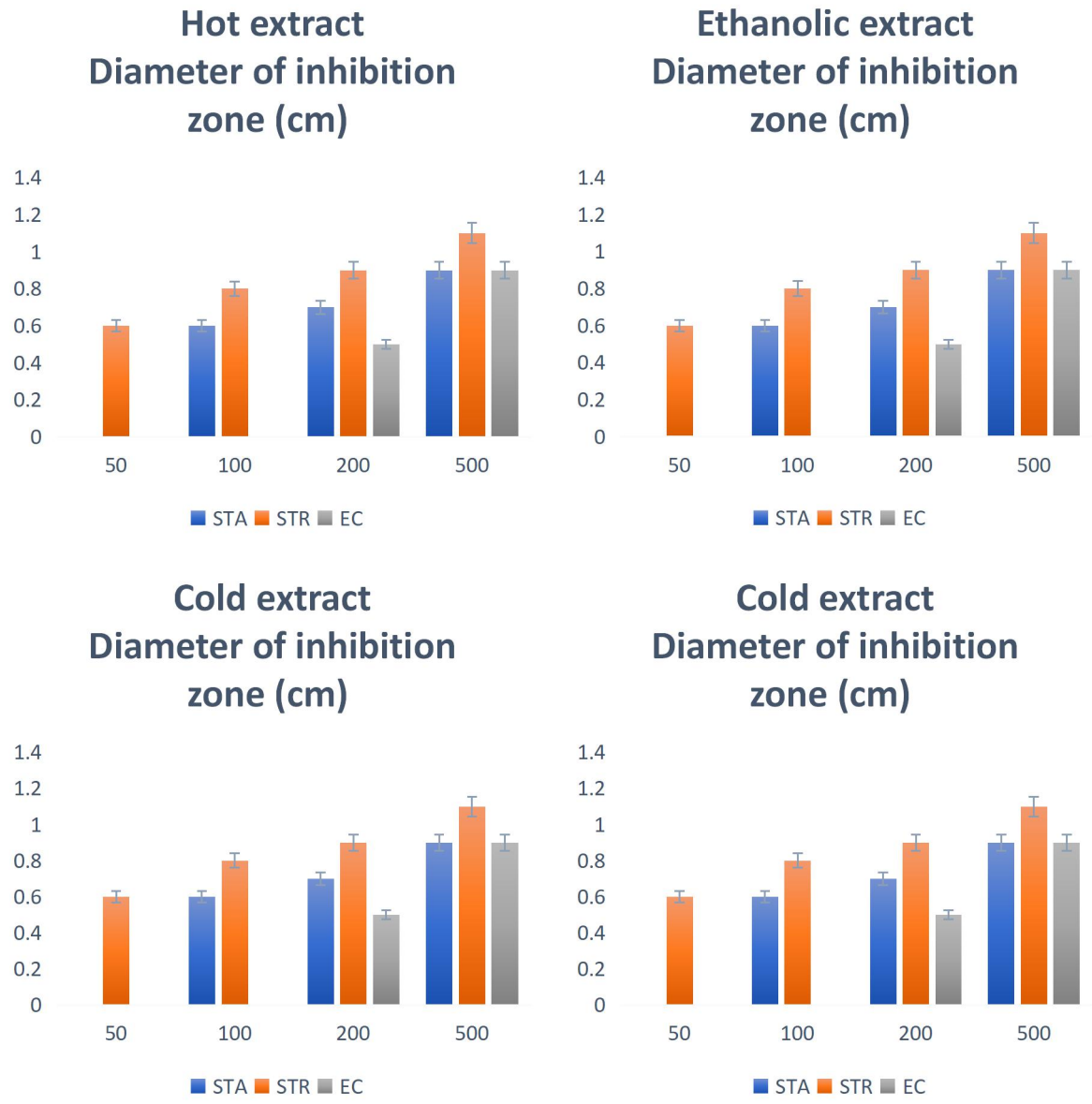
Table 1 reveals that Allium cepa ethanol, cold and hot



extracts contain saponins, flavonoids, tannins, glycosides, terpenoides, as well as amino groups on the same active compounds. The absence of phlobatanines, alkaloids, and antiquinones does not depend either on the nature of the extraction way or the used solvent for the identification of such active compounds.

The figure (1) demonstrates the comparative study of allium cepa, flavonoids and saponines, a greater proportion of aqueous hot extracts in contrast with ethanol (70%), and aqueous cold extracts. This research indicates that the extraction process is an essential aspect of the heat, since the heat contributes to improved extraction speed and efficiency. The ethanol extract has, however, values higher than cold extract due to its organic properties, resulting in extraction by using ethanol as an extraction solvent with higher volumes.

Fig. 2. The Allium cepa extracts inhibition region, on certain bacteria forms. Where-) (= No operation, EC; STR; Strptococus; STA,



Staphylus. C

Figure 2 shows that hot extract inhibition potential is higher compared to cold and ethanol extract growth (EC, Escherichi coli, STR, Strptococcus, STA, Stephylus) bacteria. It also demonstrates, through inhibition capacity of bacteria, that the ethanolic extract is the strongest extract to cold. This implies that each extract comprises the active components and the microbial killing potential of these components. We have shown that aqueous heat extract, due to the increasing solubility of an active ingredient with time, is stronger than cold aqueous and alcoholic extracts.

Conclusion

In this review, we prove that allium cepa extracts contain the same active ingredients as saponins, flavonoids, tannins, glycosides, Terpenoids, as well as amino groups as the ethanol, cold and hot extracts. The data indicate that Allium cepa has a quantitative analysis, a flavonoids and saponines appearance, higher aqueous hot extract than ethanol (70%) and aqueous cold extracts. This research indicates the essential role of heat in the extraction process, which results in improved extraction speed and productivity due to the sun. However, since photochemical molecules have organic properties and this results in higher extraction with a greater use of ethanol as extraction solvent, the ethanol extract allowed values are higher than cold extract. The findings reveal that bacteria (CE, Escherichi coli; STR, Strptococus; STA, Staphylus) have a better ability to suppress thermal extract growth compared with cold and ethenol extracts. From these findings, we appear that aqueous hot extract is better thanalcoholic extracts and cold aqueous because its temperature solubility in active components improves.

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