

Phytochemical analysis and evaluation of antioxidant potential of ethanol extract of *Allium cepa* and ultra-high homeopathic dilutions available in the market: A comparative study

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Abstract

Introduction: As per statistics available with the WHO, 80% of the earth's population rely on traditional medicine for their primary health-care needs and most of this therapy involves the use of plant extracts and their active components. **Objectives:** To confirm the presence of alkaloids, fats, steroids, tannins, flavonoids, sugars, amino acids and saponins in *Allium cepa* extract. **Method:** A qualitative phytochemical analysis has been performed to confirm the presence of these components in *Allium cepa* extract and its homeopathic formulations (mother tincture [MT], *Allium cepa* 30C and *Allium cepa* 200C). The total phenolic content, flavonoid content and antioxidant potential of the prepared extract and the various homeopathic formulations have also been studied. **Results:** Presence of various phytochemicals such as flavonoids, alkaloids, saponins, steroids, carbohydrates and amino acids have been confirmed in the prepared extract as well as the MT. According to calculations using Avogadro's limit, preparations above 12C dilution should have no source material present. It is interesting to note that even though the formulations *Allium cepa* 30C and 200C are considered ultra-high dilutions, they gave a positive result for many phytochemicals. The total phenolic content, flavonoid content and antioxidant potential of the prepared extract and various homeopathic formulations have also been studied. **Conclusion:** The positive qualitative and quantitative results also reinforce the growing belief that Homoeopathy is not just a placebo effect but a 'Smart medicine' which may be working on the nanoscale. More research is required to understand various aspects.

Keywords: 2,2-diphenyl-1-picrylhydrazyl, *Allium cepa* extract, Homoeopathy, Mother tincture, Nanomedicine, Phytochemical analysis

INTRODUCTION

Traditional medicine is the sum total of the knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, treatment or improvement of physical and mental illness.^[1] The WHO has developed and launched the traditional medicine strategy 2014–2023 in response to the World Health Assembly resolution on traditional medicine (62.13). The strategy aims to support member states in developing proactive policies and implementing action plans that will strengthen the role traditional medicine plays in keeping populations healthy. *Allium cepa* (Onion) is one of the most important commercial condiment vegetables grown and consumed not only in India but also worldwide. It is known that onions may help guard against many chronic diseases and are highly valued for their

therapeutic properties. It has been reported to be very high in quercetin content. It is said to be particularly useful in the treatment of patients suffering from running eyes and nose. The onions ability to relieve congestions, especially in the lungs and bronchial tract is well documented.^[2] Onions contain large amounts of flavonoids such as quercetin which is abundant in onions and protects against cataracts, cardiovascular diseases and cancer.^[3,4] Organosulfur compounds present in it have been linked to lowering blood pressure and cholesterol levels.^[5] It is known to possess anthelmintic, anti-inflammatory, antiseptic,

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antispasmodic, carminative, diuretic, expectorant, febrifuge, hypoglycaemic and hypotensive properties.^[6,7] Onion relieves stomach upset and other gastrointestinal disorders and also strengthens the appetite.

Homeopathy is a time-tested two-century-old empirical system of healing. Homeopathic medicines are prepared through a characteristic process known as potentization, where serial dilutions are performed with strong strokes at each step of dilution.^[8] Homeopathic pharmacists prepare medicines from various biologically active substances that belong to two main groups: organic materials (plants, animal products and nosodes) and inorganic substances (synthetic chemicals, metal alloys and natural and synthetic ceramic materials).^[9] These bioactive materials are subjected to specific manufacturing procedures whereby they are dissolved in water and alcohol. To become homeopathic remedies, medicinal compounds are diluted hundreds, even thousands of times to reduce their toxicity and to ensure that they are biologically active and compatible with the processes of human physiology. The major objection to homeopathic medicine is that the doses of medicine prescribed in some cases are too dilute (beyond Avogadro limit) for any active ingredient to be present. The medicines, therefore, receive criticism on their activity and are termed as having a placebo effect. A further examination of dilution to establish that homeopathic medicines may not be as dilute as a simplistic application of Avogadro's Principle but retains the original source substance due to surface effects has been explained by some mathematical models based on Langmuir equation.^[10]

New evidence is emerging on the nature and properties of high dilution of homeopathic medicines. These findings indicate that the science of Homeopathy is a form of Nanomedicine, with the medicines capable of initiating changes in the physiological and biochemical dynamics of the animal as a complex adaptive system.^[11] Several lines of evidence suggest that homeopathic high dilutions do have pharmacological action.^[10]

In the present work, we have prepared *Allium cepa* extract, studied the antioxidant activity, measured the total flavonoid and phenolic content, carried out its phytochemical analysis and compared it with the mother tincture (MT) of *Allium cepa* and homeopathic dilutions 30C *Allium cepa* and 200C *Allium cepa*.

METHODOLOGY

Allium cepa MT, 30C and 200C (Dr. Reckeweg) have been used for all studies. All other chemicals have been procured from Sigma-Aldrich. All reagents have been prepared following standard protocols. *Allium cepa* MT has been used as the positive control.

Preparation of onion extract

The onion bulb was washed with freshly prepared sterile distilled water. The outer covering of the bulb was manually

peeled off, and the fleshy part of the onion was rewashed with freshly prepared sterile distilled water and weighed. The onion bulb was cut into small parts and squashed. To the squashed preparation, 90% ethanol (200 mL) was added for 8 h with 10 min interval shaking. The extraction was filtered using muslin cloth and Whatman No. 1 filter paper. The filtrate was evaporated at 45°C to dryness and was kept in a sterile bottle and refrigerated until use.

Determination of the total phenolic content

The concentration of phenolics in the samples was determined using spectrophotometric method of Singleton and Rossi.^[12] The samples were prepared in triplicate for each analysis and the mean value of absorbance was obtained. A 1 mg/mL methanol solution of the extract was prepared for analysis. The reaction mixture was prepared by mixing 0.5 mL of methanol solution of extract/samples, 2.5 mL of 10% Folin–Ciocalteu's reagent in water and 2.5 mL 7.5% NaHCO₃. The blank is prepared by mixing 0.5 mL methanol, 2.5 mL 10% Folin–Ciocalteu's reagent dissolved in water and 2.5 mL of 7.5% of NaHCO₃. The samples were incubated in a thermostat at 45°C for 45 min and the absorbance determined spectrophotometrically at λ_{max} 765 nm. The same procedure is repeated for the standard solution of gallic acid and the calibration line is construed. Based on the measured absorbance, the concentration of phenolics was read (mg/mL) from the calibration line, and the content of phenolics in the samples was expressed in terms of gallic acid equivalent (mg of GA/mL of sample).

Determination of the total flavonoid content

The total flavonoid content was measured with the aluminium chloride colorimetric assay.^[13] One millilitre of methanol and 1 mL of standard quercetin solution (5, 10, 20, 40, 60, 80 and 100 µg/mL) were added to the test tubes. This was followed by 4 mL of distilled water and 0.3 mL of 5% sodium nitrite solution in each. A volume of 0.3 mL of 10% aluminium chloride was added after 5 min followed by 2 mL of 1 M sodium hydroxide. The volume was made up to 10 mL with distilled water and the contents were mixed well. An orange yellowish colour developed. The absorbance was measured at 510 nm spectrophotometrically. The samples were prepared in triplicate. A calibration curve was plotted using the values for standard quercetin. The data of total flavonoid content were expressed as milligram of quercetin equivalents/mL of sample.

Determination of the antioxidant potential

The ability of the plant extract/sample to scavenge 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radicals is assessed by the standard method.^[14] A simple method that has been developed to determine the antioxidant activity of foods utilises the stable DPPH radical. The odd electron in the DPPH free radical gives a strong absorption maximum at 517 nm and is purple in colour. The colour turns from purple to yellow as the molar absorptivity of the DPPH radical at 517 nm reduces when the odd electron of DPPH radical becomes paired with hydrogen from a free radical scavenging antioxidant to form the reduced DPPH-H. The resulting decolourisation is

stoichiometric with respect to number of electrons captured. The samples are prepared in triplicate for each analysis and the mean value of absorbance is obtained. The stock solution of the extract was prepared in methanol to achieve the concentration of 1 mg/mL. Dilutions were made to obtain concentrations of 1000, 900, 800, 700, 600, 500 and 400 µg/mL. Diluted solutions (1 mL each) were mixed with 1 mL of methanolic solution of DPPH in concentration of 1 mg/mL. After 30 min incubation in darkness at room temperature (23°C), the absorbance was recorded at 517 nm. Control sample contained all the reagents except the extract. Percentage inhibition was calculated and IC₅₀ values were estimated from the percentage inhibition versus concentration plot.

Qualitative phytochemical analysis

Plants contain many bioactive chemical substances that produce definite physiological and biochemical actions in the human body. These bioactive constituents are alkaloids, tannin, flavonoids, phenolic compounds, etc.^[15,16] Since *Allium cepa* has received considerable attention in recent years due to diverse pharmacological properties including antioxidant and antitumor activity, a preliminary phytochemical study to determine the phytoconstituents present was undertaken for the extract prepared and the homeopathic formulations. The ethanol extract was considered suitable since the homeopathic formulations are in ethanol medium. All tests were performed on the blank. The MT is used as the positive control.

Test for steroids

Salkowski reaction

To the different sample solutions, chloroform was added followed by concentrated sulphuric acid along the sides of the tube. A red-brown colouration indicated the presence of steroids.

Test for alkaloids

The samples were dissolved separately in 1% HCl. One millilitre of the solution was taken and a few drops of the following reagents were added and various tests performed.

Dragendorff's test

One millilitre of Dragendorff's reagent was added to the different sample solutions. Formation of reddish brown precipitate indicated the presence of alkaloids.

Mayer's test

One millilitre of Mayer's reagent was added to the different sample solutions. Formation of cream colour precipitate indicated the presence of alkaloids.

Hager's test

One millilitre of Hager's reagent was added to the different sample solutions. Formation of yellow colour precipitate indicated the presence of alkaloids.

Wagner's test

One millilitre of Wagner's reagent was added to the different sample solutions. Formation of reddish brown precipitate indicated the presence of alkaloids.

Test for tannins

Ferric chloride test

Different sample solutions were treated with ferric chloride solution; appearance of blue and green colours indicated the presence of hydrolysable and condensed tannins.

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.

Test for flavonoids

Alkaline reagent test

To the different sample solutions, a few drops of sodium hydroxide solution were added. Formation of intense yellow colour, which turned colourless after addition of few drops of dilute hydrochloric acid, indicated the presence of flavonoids.

Shinoda test

To the different sample solutions, a few magnesium turnings were added followed by a few drop of concentrated hydrochloric acid. Appearance of a crimson red colour indicated the presence of flavonoids.

Test for carbohydrates

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 was slowly added down the sides of the sloping test tube. Appearance of purple ring at the junction indicated the presence of carbohydrates.

Fehling's test (for reducing sugars)

The sample solutions are mixed with a small amount of Fehling's solution and heated. Appearance of a red precipitate indicated the presence of a reducing sugar.

Test for saponin glycosides

Froth formation test

A small quantity of the samples was diluted with 20 mL of distilled water and shaken vigorously; formation of 1 cm layer of foam which is stable for 10 min indicated the presence of saponins.

Test for amino acids

Ninhydrin test

A solution of ninhydrin in ethanol is added to the sample solutions. Appearance of a purple colour indicated the presence of amino acids.

Test for cardiac glycosides

Keller-Killiani test

Glacial acetic acid (0.4 mL) and a few drops of 5% ferric chloride solution are added to the sample solutions. Concentrated sulphuric acid (0.5 mL) is added along the side of the test tube carefully. The formation of blue colour

in the acetic acid layer confirmed the presence of cardiac glycosides.

Test for anthraquinone glycosides

Hydroxyanthraquinone test

To 1 mL of the samples, a few drops of 10% potassium hydroxide solution were added. The formation of a red colour confirmed the presence of anthraquinone glycosides.

Test for proteins

Biuret test

To 2 mL of the sample solutions, 5 drops of 1% copper sulphate 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.

RESULTS

Total phenolic content

The total phenolic contents of the samples using Folin–Ciocalteu's reagent are expressed in terms of gallic acid equivalent in Figure 1. The reagent which is a mixture of phosphotungstic acid and phosphomolybdic acid which after oxidation of the phenols is reduced to a mixture of blue oxides of tungsten and molybdenum. The blue colouration produced has a maximum absorption in the region of 765 nm and is proportional to the total quantity of phenolic compounds originally present. The total phenolic content for *Allium cepa* extract and various homeopathic formulations are presented in Table 1 and Figure 2.

Total flavonoid content

The concentration of flavonoids in *Allium cepa* extract was determined using spectrophotometric method with aluminium chloride. The standard curve for quercetin is provided in Figure 3. The total flavonoid content was expressed in terms of microgram quercetin equivalent in Figure 4. The results for the total flavonoid content for *Allium cepa* extract and various homeopathic formulations are presented in Table 2.

Antioxidant potential

The scavenging activity percentage (AA%) was determined using equation 1 according to Mensor *et al.*^[14] Antioxidant (DPPH scavenging) activity of *Allium cepa* extract is presented as percentage of DPPH radicals inhibition in Figure 5 Ascorbic acid is used as a reference. The IC₅₀ value of the extract is found to be 915 µg/mL. The DPPH radical scavenging activity for *Allium cepa* extract and various homeopathic formulations is presented in Table 3. *Allium cepa* extract and MT show appreciable antioxidant activity while the homeopathic formulations 30C and 200C do not show any appreciable antioxidant activity.

$$AA\% = 100 - \left(\frac{A_{\text{sample}} - A_{\text{blank}}}{A_{\text{control}}} \times 100 \right) \quad (1)$$

Phytochemical analysis

Although quantitative analysis is more sensitive to very small amount of the active constituents, qualitative analysis is the first step in any analysis. The qualitative analysis of

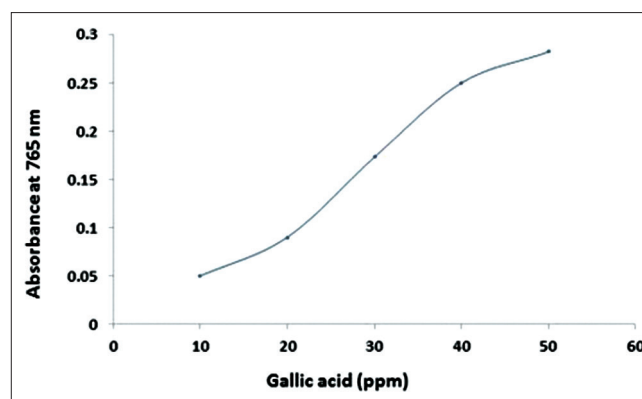


Figure 1: Total phenolic content expressed as milligram of gallic acid equivalents. Standard curve for gallic acid

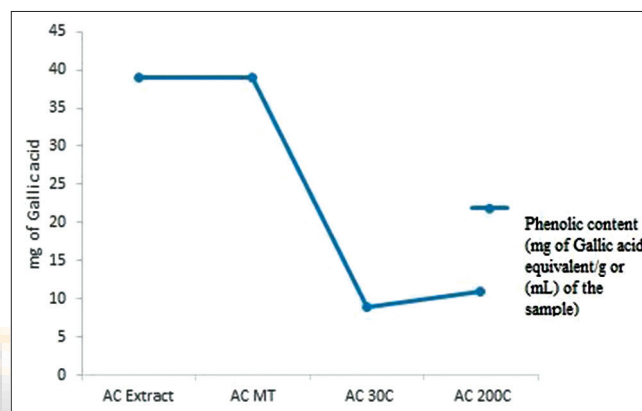


Figure 2: Variation in the total phenolic content expressed as milligram of gallic acid equivalents for different samples

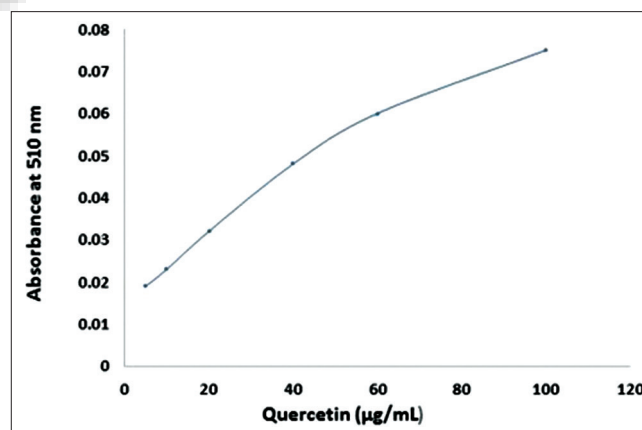


Figure 3: Total flavonoid content expressed as milligram of quercetin equivalents. Standard curve for quercetin

onion extract and *Allium cepa* preparations available in the market showed the presence or absence of phytochemicals as shown in Table 4. The phytochemical evaluation of the various phytoconstituents is shown in Figure 6. We see the presence of various important bioactive constituents in the sample solutions of ultra-dilute homeopathic formulations. This is a very important finding given that mathematically

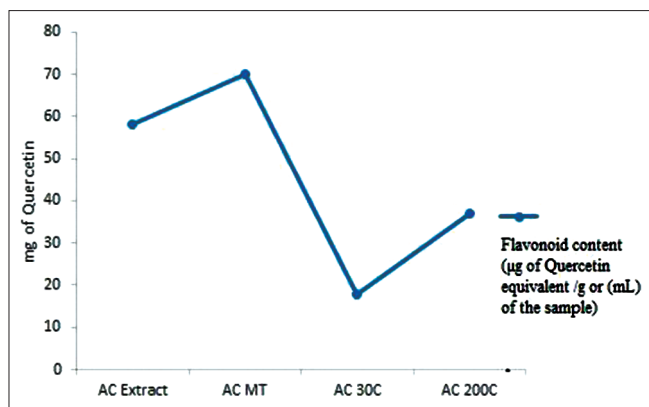


Figure 4: Variation in total flavonoid content expressed as microgram of quercetin equivalents

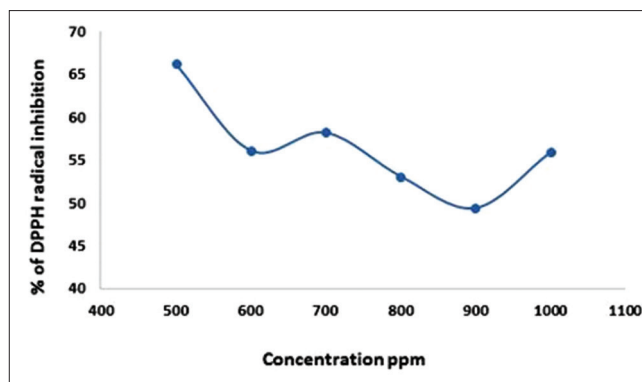


Figure 5: Antioxidant (2,2-diphenyl-1-picrylhydrazyl scavenging) activity of *Allium cepa* extract presented as percentage of 2,2-diphenyl-1-picrylhydrazyl radicals inhibition

Table 1: Total phenolic content for the *Allium cepa* extract and various homeopathic formulations

Samples	Phenolic content (mg of gallic acid equivalent/g or (mL) of the sample)
Extract (1 mg/mL)	39.3±0.09
MT	39.2±0.08
30C	9.6±0.09
200C	11.4±0.09

MT: Mother tincture

Table 3: The 2,2-diphenyl-1-picrylhydrazyl radical scavenging activity for the *Allium cepa* extract and various homeopathic formulations

Samples	Percentage DPPH radical scavenging activity
Extract (1000 ppm)	55.6±0.14
MT	39.8±0.09
30C	-
200C	-

DPPH: 2,2-diphenyl-1-picrylhydrazyl; MT: Mother tincture

Table 2: Total flavonoid content for the *Allium cepa* extract and various homeopathic formulations

Samples	Flavonoid content (mg of quercetin equivalent/g or (mL) of the sample)
Extract (1 mg/mL)	8.6±0.12
MT	70.4±0.09
30C	18.4±0.09
200C	37.6±0.14

MT: Mother tincture

Table 4: Qualitative phytochemical analysis of extract of onion and *Allium cepa* preparations available in the market

Phytochemicals	Extract	MT	30C	200C
Steroids	+	+	-	-
Alkaloids	+	+	+	+
Tannins	+	+	+	+
Flavonoids	+	+	-	-
Carbohydrates	+	+	+	+
Saponins	+	+	+	+
Amino acids	+	+	-	-
Cardiac glycosides	+	+	+	+
Antraquinone glycosides	+	+	-	-
Proteins	+	+	+	+

MT is used as the positive control. +: Presence; -: Absence of the components; MT: Mother tincture

we do not expect any active material present in these ultra-dilute solutions. More research needs to be carried out in this direction.

DISCUSSION

Our qualitative and quantitative studies show that homeopathic preparations of *Allium cepa* MT, 30C and 200C show the presence of many important phytochemicals even in the ultra-dilute preparations. This study validates the claim made by a scientist that homeopathic formulations retain the starting material in spite of being ultra-dilute. This has been attributed to the succussion process followed to prepare different potencies. The succussion given to the liquid mass is expected to produce particles of varied shapes and sizes due to shearing forces generated during

the pounding of the liquid container against an elastic stop. Mathematical modelling and study of physiochemical properties suggest that surface effects are responsible for the transfer of active ingredients during successive dilutions such that even ultra-dilute solutions show retention of active ingredients.

CONCLUSION

The controversy regarding Homeopathy medicines having high potencies i.e., 30C and 200C which involve huge dilution

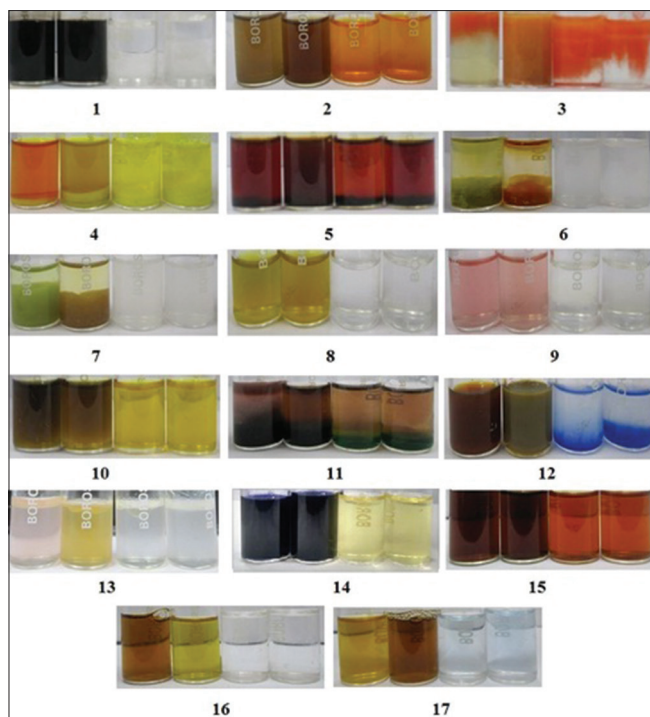


Figure 6: Phytochemical evaluation of bioactive phytoconstituents by colour reactions. (1) Steroids - Salkowski test, (2) Alkaloids - Dragendorff test, (3) Mayer test, (4) Hager test, (5) Wagner test, (6) Tannins - Ferric chloride test, (7) Lead acetate test, (8) Flavonoids - Alkaline reagent test before HCl addition, (9) Alkaline reagent test after HCl addition, (10) Shinoda's test; (11) Sugars - Molisch's test, (12) Fehling's test, (13) Saponins - Foam test, (14) Amino acids - Ninhydrin test, (15) Cardiac glycosides - Keller-Killiani test; (16) Anthraquinone glycosides - Hydroxyanthraquinone test, (17) Proteins - Biuret test

factors (10^{-60} and 10^{-400} , respectively), such that theoretically there should be no measurable remnants of the starting materials is being disputed by many scientists. The results for the quantitative evaluation of flavonoid and phenolic content and the qualitative phytochemical analysis of *Allium cepa* extract, MT, 30C and 200C show that various bioactive phytochemicals such as alkaloids, tannins, saponins, carbohydrates, cardiac glycosides and proteins are retained even in ultra-dilute solutions. The prepared *Allium cepa* extract and MT show good antioxidant properties, whereas *Allium cepa* 30C and 200C show limited antioxidant potential. Recent studies indicate that nanoparticles of active material exist in solutions of homeopathic

formulations. Further interdisciplinary research is necessary to unravel the mystery of these wonderful formulations.

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Conflicts of interest

None declared.

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बाजार में उपलब्ध एलीयम सेपा और अल्ट्रा-हाई होम्योपैथिक डाइल्यूसन्स के इथेनाल उदरण की प्रतिउपचायक (एंटीऑक्सीडेंट) क्षमता का पादप रसायन (फाइटोकैमिकल) विश्लेषण और मूल्यांकन: एक तुलनात्मक अध्ययन।

सार

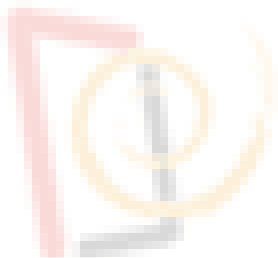
पृष्ठभूमि: विश्व स्वास्थ्य संगठन (डब्ल्यूएचओ) से उपलब्ध आंकड़ों के अनुसार, विश्व की 80 प्रतिशत जनसंख्या अपनी प्राथमिक स्वास्थ्य देखभाल की जरूरतों के लिए परंपरागत चिकित्सा पर निर्भर है और इस चिकित्सा में मुख्य रूप से पादप अर्क और उनके सक्रिय घटकों का उपयोग शामिल है।

उद्देश्य: एलीयम सेपा अर्क में क्षाराम (एल्कलॉइड), वसा, स्टेरॉयड, टैनिन, फलेवोनोइड, शर्करा, एमिनो एसिड, सैपोनिन आदि की उपस्थिति की पुष्टि करना

सामग्री और विधि: सभी अध्ययनों के लिए एलीयम सेपा एम.टी., 30सी, 200सी (डॉ. रेकवेग) का उपयोग किया गया। सभी अन्य रसायनों की खरीद सिग्मा अल्डरिक से की गई। मानक प्रोटोकॉलो का अनुसरण कर सभी अभिकर्मकों को तैयार किया गया।

परिणाम: तैयार अर्क व मदर टिंचर दोनों में फलेवोनोइड, एल्कलॉइड, सैपोनिन, स्टेरॉयड, कार्बोहाइड्रेट और एमिनो एसिड जैसे विभिन्न पादप रसायन (फाइटोकैमिकल) की उपस्थिति की पुष्टि की गई है। अवागाड्रो लिमिट के अनुसार, 12सी डाइल्यूशन से अधिक क्षमता की तैयार औषधि में स्त्रोत सामग्री मौजूद नहीं होनी चाहिए। यह दिलचस्प है कि एलीयम सेपा 30सी और 200सी यौगिकों को अल्ट्रा-हाई डाइल्यूशन माना जाता है, लेकिन उन्होंने कई पादप रसायनों (फाइटोकैमिकल्स) के लिए सकारात्मक परिणामों का प्रदर्शन किया। तैयार उदरण तथा विभिन्न होम्योपैथिक योगों की कुल फेनालिक सामग्री, फलेवोनॉइड सामग्री और एंटीआक्सीडेंट क्षमता का भी अध्ययन किया गया।

निष्कर्ष: सकारात्मक, गुणात्मक और मात्रात्मक परिणाम इस विश्वास को सुदृढ़ कर रहे हैं कि होम्योपैथी सिर्फ एक प्लासिबो प्रभाव ही नहीं बल्कि एक 'स्मार्ट औषधि' है जो शायद नैनो पैमाने पर काम करती है। विभिन्न पहलुओं को समझने के लिए अधिक अनुसंधान की आवश्यकता है।



Phytochemische Analyse und Bewertung des Antioxidanspotentials von Ethanol-Extrakt von Allium cepa und ultra-hohen homöopathischen Verdünnungen auf dem Markt verfügbar: Eine vergleichende Studie

Einführung: Nach den Statistiken, die mit der WHO zur Verfügung stehen, verlassen sich 80% der Erdbevölkerung auf die traditionelle Medizin für ihre primären Gesundheitsversorgung und die meisten dieser Therapie beinhaltet die Verwendung von Pflanzenextrakten und deren aktiven Komponenten.

Ziel: Eine qualitative phytochemische Analyse wurde durchgeführt, um die Anwesenheit verschiedener Komponenten wie Alkaloide, Fette, Steroide, Tannine, Flavonoide, Zucker, Aminosäuren, Saponine im Allium-Cepa-Extrakt und seine homöopathischen Formulierungen (Mutter-Tinktur, Allium cepa 30C und Allium cepa 200C) .

Materialien und Methoden: Allium cepa MT, 30C, 200C (Dr. Reckeweg) wurden für alle Studien verwendet. Alle anderen Chemikalien wurden von Sigma Aldrich beschafft. Alle Reagenzien wurden nach Standardprotokollen hergestellt.

Ergebnis: Die Anwesenheit verschiedener Phytochemikalien wie Flavonoide, Alkaloide, Saponine, Steroide, Kohlenhydrate und Aminosäuren wurde im präparierten Extrakt sowie in der Muttertinktur bestätigt. Nach Berechnungen unter Verwendung von Avogadro's Limit, sollten Vorbereitungen über 12C Verdünnung kein Ausgangsmaterial vorhanden sein. Es ist interessant zu bemerken, dass, obwohl die Formulierungen Allium cepa 30C und 200C als ultra-hohe Verdünnungen gelten sie ein positives Ergebnis für viele Phytochemikalien gegeben.

Fazit: Die positiven qualitativen und quantitativen Ergebnisse verstärken auch den wachsenden Glauben, dass Homöopathie nicht nur ein Placebo-Effekt ist, sondern eine "intelligente/schlaue Medizin", die auf der Nanoskala arbeiten kann.

Análisis fitoquímico y evaluación del potencial antioxidante del extracto de etanol de *Allium cepa* y las ultra diluciones homeopáticas en el mercado: estudio comparativo

Resumen

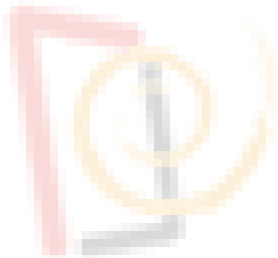
Fundamento: Conforme a la estadística disponible por la OMS, el 80 % de la población de la tierra confía en la medicina tradicional para sus necesidades de atención primaria y la mayoría de estas terapias implica el uso de extractos de plantas y sus componentes activos.

Objetivos: Se efectuó un análisis fitoquímico cualitativo para confirmar la presencia de diferentes componentes como alcaloides, grasas, esteroides, taninos, flavonoides, azúcares, aminoácidos y saponinas en el extracto de *Allium cepa* y sus formulaciones homeopáticas (tintura madre, *Allium cepa* 30C y *Allium cepa* 200C).

Materiales y métodos: En todos los estudios, se utilizó *Allium cepa* tintura madre, 30C, 200C (Dr. Reckeweg). Todos los restantes productos químicos se han procurado de Sigma Aldrich. Todos los reactivos se han preparado cumpliendo los protocolos estándar.

Resultados: En el extracto preparado, así como en la tintura madre, se ha confirmado la presencia de diferentes fitoquímicos como flavonoides, alcaloides, saponinas, esteroides, hidratos de carbono y aminoácidos. Conforme a los cálculos aplicando los límites de Avogadro, las preparaciones por encima de la dilución de la 12C no deben mostrar presencia del material de origen. Cabe destacar que pese a que las formulaciones de *Allium cepa* 30C y 200C se consideran ultradiluciones, han dado resultados positivos para muchos fitoquímicos.

Conclusiones: Los resultados cualitativos y cuantitativos positivos también refuerzan la creciente consideración de que la homeopatía no solo es un efecto placebo, sino una medicina “inteligente” que puede funcionar a nanoescala.



Analyse phytochimique et évaluation du potentiel antioxydant de l'extrait éthanolique d'*Allium cepa* et des dilutions homéopathiques ultra-élevées disponibles sur le marché: étude comparative

Abstrait

Contexte: Selon les statistiques disponibles auprès de l'OMS, 80% de la population de la Terre s'appuie sur la médecine traditionnelle pour leurs besoins primaires en soins de santé et la plupart de cette thérapie implique l'utilisation d'extraits de plantes et de leurs composants actifs.

Objectif: Une analyse phytochimique qualitative a été effectuée pour confirmer la présence de divers composants comme les alcaloïdes, les graisses, les stéroïdes, les tanins, les flavonoïdes, les sucres, les acides aminés, les saponines dans l'extrait *Allium cepa* et ses formulations homéopathiques (Teinture mère, *Allium cepa* 30C et *Allium cepa* 200C).

Matériaux et Méthodes: *Allium cepa* MT, 30C, 200C (Dr. Reckeweg) a été utilisé pour toutes les études. Tous les autres produits chimiques ont été achetés chez Sigma Aldrich. Tous les réactifs ont été préparés selon des protocoles standard.

Résultats: La présence de divers phytochimiques comme les flavonoïdes, les alcaloïdes, les saponines, les stéroïdes, les glucides et les acides aminés a été confirmée dans l'extrait préparé ainsi que dans la teinture mère. Selon les calculs utilisant la limite d'Avogadro, les préparations au-dessus de la dilution 12C ne devraient pas présenter de source. Il est intéressant de noter que même si les formulations *Allium cepa* 30C et 200C sont considérées comme des dilutions ultra-élevées, elles ont donné un résultat positif pour de nombreux produits phytochimiques.

Conclusion: les résultats qualitatifs et quantitatifs positifs renforcent également la croyance croissante que l'homéopathie n'est pas seulement un effet placebo, mais un «médicament intelligent» qui peut fonctionner à l'échelle nanométrique.

紅洋蔥酒精提取物及市面上超高度順勢療法稀釋液之抗氧化潛能的植物化學分析及評估：對比研究

摘要

背景：據世界衛生組織的統計，地球上80%人口依賴傳統醫學以滿足基層醫療保健的需要，大多數傳統醫學都涉及植物提取物及其活性成份。

目標：進行了一項定性的化學分析，以確認紅洋蔥酒精提取物及其順勢療法稀釋液中(紅洋蔥母酞、紅洋蔥30C、及紅洋蔥200C)，是否含有多種成份，如生物鹼、脂肪、類固醇、丹甯酸、黃酮類物質、糖類、氨基酸及皂苷。

材料與方法：所有研究均使用(芮克偉醫生的)紅洋蔥母酞、紅洋蔥30C、及紅洋蔥200C。所有其他化學品均從西格瑪奧德里奇公司採購。所有試劑都按標準的議定方案預備。

結果：證實在提取物及母酞中可找到不同的植物化學物質，如黃酮類物質、生物鹼、皂苷、類固醇、碳水化合物和氨基酸。根據阿伏伽德羅常數的極限來計算，12C以上的稀釋應該沒有任何原材料存在。值得注意的是，儘管紅洋蔥30C、及紅洋蔥200C被認為是超高度的稀釋液，他們仍在多項植物化學物質的分析中呈陽性結果。

結論：陽性的定性和定量結果強化了一個愈來愈普及的信念，順勢療法並不僅僅是一種安慰劑效應，而是一種「聰明的醫藥」，可能在納米的尺度下運作。

