Original Article

An *in vitro* study of *Hydrangea arborescens*, homoeopathic preparation as an inhibitor of *Calcium oxalate* crystallisation

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Abstract

Background: Homoeopathic mother tincture *Hydrangea arborescens* (*Hydrang*.) is conventionally used for urinary complaints, such as urinary tract infection, renal stones and prostate hypertrophy. However, the mode of its action for annihilation of complaints remains uncertain. This study was designed to investigate *in vitro* effect of homoeopathic preparations of *Hydrang*. on urolithiasis (*Calcium oxalate* [CaOx] crystallisation). **Objective:** To analyse the role of *Hydrang*. a, homoeopathic preparation in an *in-vitro* CAOx crystallisation. **Materials and Methods:** Spectrophotometric crystallisation assay was carried on and the slopes of nucleation and aggregation phases were calculated using linear regression analysis, and the percentage inhibition exerted by the *Hydrang. Q*, 6C, 30C and 200C was calculated. Microscopic observations of crystals of CaOx were carried out in the presence and in the absence of *Hydrang. Q*, 6C, 30C and 200C to support the spectrophotometric crystallisation assay. **Results:** The crystallisation studies performed indicate *Hydrang*. to be a potent medicine against CaOx crystallisation both at the level of nucleation and aggregation. *Hydrang. Q* favours aggregation to a great extent by showing the inhibition of about -15%; while for 6C, 30C and 200C, the percentage inhibition was 13.70%, 42.30% and 14.90%, respectively. This shows inhibitory nature for aggregation, with maximum inhibition shown by *Hydrang*. 30C potency. **Conclusion:** The homoeopathic preparations of the *Hydrang.* inhibit the primary events of stone formation. The findings of the above experiment show the evidence to support the usefulness of *Hydrang.* in the cases of renal calculi.

Keywords: *Calcium oxalate*, Crystallisation, Homoeopathy, *Hydrangea arborescens*, Renal stone inhibitors, Urolithiasis

Introduction

Urolithiasis or urinary tract stones are among the most common and painful diseases of human beings. This is the third most common urinary tract disease that may lead to renal failure. Urolithiasis affects about 12% of the world population at some stage in their life time. It affects all ages, sex and races but occurs more frequently in men than in women, within the age group of 20–49 years.[1] In India, about 12% of the population is estimated to have urinary stones, and out of which, 50% may end up with renal failure. Calcium stones are predominant renal stones comprising about 80% of all urinary calculi.[2] The proportion of calcium stones may account for pure Calcium oxalate (CaOx, 50%), Calcium phosphate (termed as apatite, 5%) and a mixture of both (45%). Calcium oxalate monohydrate (COM) is the most thermodynamically stable form of stone. COM is more frequently observed than Calcium oxalate dihydrate in clinical stones.[3] Apart from conservative treatment, shock-wave lithotripsy and ureteroscopy are commonly practiced in conventional medicine in cases of calculi, but these interventions are expensive for the common people and may lead to complications.[4]

Besides the constitutional or individualized treatment, appropriate homoeopathic organ-specific medicines selected on the basis of the important particular symptoms can also be effective.[5] The method assumes that certain remedies have a specific affinity for certain organs; there are patients in whom it is desirable or necessary to treat specific organs or system in order that the whole person may be properly cured.[6] Organopathic prescriptions are made based on the Paracelsus principle that the given drugs affect given organs (parts) by self-elective

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preference. Many doctors have given in their experiences on the importance of selection of organopathic remedies.[7] In the homoeopathic literature, Boericke mentions, '*Hydrang.* causes burning in urethra frequent desire urine hard to start heavy deposits of mucus sharp pain in loins, especially left gravelly deposits. Profuse deposits white amorphous salts'.[8] *Hydrang.* has profound action on the kidneys and ureteric stones; the case report has justified the fact. However, randomised control trials on action of *Hydrang.* in cases of urinary stones are suggestive.[5] Hansen adds that it is particularly useful for profuse deposits of white amorphous salts in urine; and has arrested the tendency of formation of calculi, relieves distress from renal calculus.[9] Its properties include cracking stone in small pieces or leaching stone to softer and smaller, increasing urinary outflow.[10] Clarke mentions it as a 'stone-breaking remedy having being used in calculus diseases.'[11]

Materials and Methods

Drugs and chemicals

Homoeopathic preparation of *Hydrang. Q*, 6C, 30C and 200C was procured from Dr Willmar Schwabe India Pvt Ltd., a GMP-certified pharmaceutical company. All other chemicals and reagents used were of analytical grade.

Spectrophotometric crystallisation assay

Spectrophotometric crystallisation assay was carried out by the method of Hess et al.[12] CaOx crystals were synthesized by preparing the following solutions:

50% unsuccussed Ethanol was used as control in the present study because 90% Ethanol favours crystallization process, as samples of Hydrang. Q, 6C, 30C and 200C each have different percentage of alcohol.

The solution A was prepared in deionized water containing 200 mmol/L Sodium chloride, 10 mmol/L Sodium acetate and 1.5 mmol/L of Potassium oxalate (pH 5.7).

The solution B was prepared in deionized water containing 200 mmol/L Sodium chloride, 10 mmol/L Sodium acetate and 8.5 mmol/L of Calcium chloride (pH 5.7).

In a quartz cuvette containing 1 ml solution A, 1 ml of solution B was added to give a final concentration of calcium 4.25 mmol/L and oxalate 0.75 mmol/L. The time course of the optical density (OD) at 620 nm was measured automatically using a UVIKON 930 spectrophotometer (UV 1800, Shimadzu Corporation, Japan). The values were also measured in the 50 µl, and 100 µl of *Hydrang. Q*, 6C, 30C and 200C OD at 620 nm increases initially during nucleation phase and decreases during the aggregation phase.

Slopes of the nucleation (till the maximum) and aggregation (after the peak) phases were calculated at 620 nm using linear regression analysis, and the percentage inhibition exerted by the samples was calculated using the formula: Percentage inhibition = ([S0 − S1]/S0) × 100, where S0 is the slope of the control and S1 is the slope of test samples.[13]

Light microscopic studies

CaOx crystals for light microscopic studies were prepared according to the method of Nakai *et al*. CaOx crystals were formed as follows.

The solution A was prepared in deionized water containing 200 mmol/L *Sodium chloride*, 10 mmol/L *Sodium acetate* and 0.1 ml of 20 mmol/L *Potassium oxalate* (pH 6.5).

The solution B was prepared in deionized water containing 200 mmol/L *Sodium chloride*, 10 mmol/L *Sodium acetate* and 0.2 ml of 20 mmol/L *Calcium chloride* (pH 6.5).

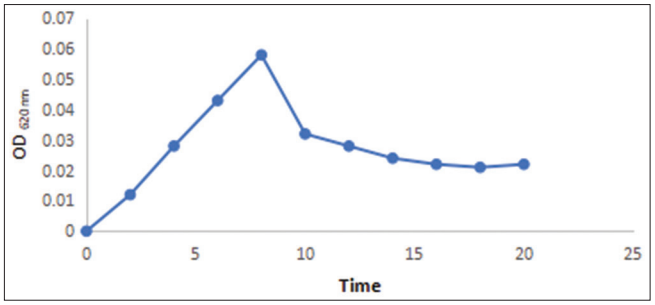

Figure 1: Standard graph for *in vitro Calcium oxalate* crystallisation

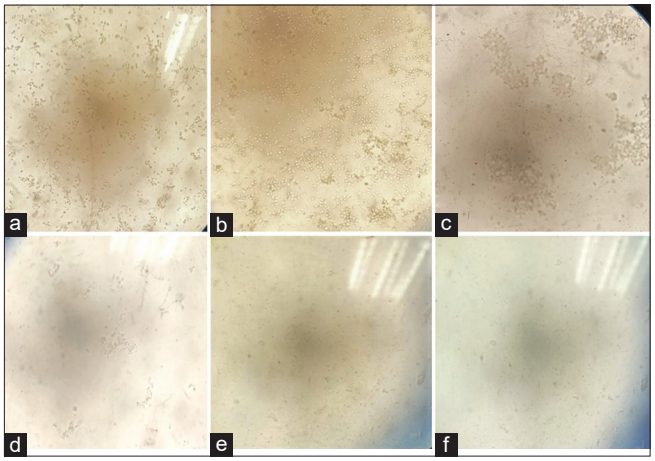

Figure 2: (a-f) Pattern of *Calcium oxalate* crystals: (a) Concentrated with *Calcium oxalate* (b) with *Ethanol* 50%, (c) *Hydrangea arborescens Q*, (d) *Hydrangea arborescens* 6C, (e) *Hydrangea arborescens* 30C, (f) *Hydrangea arborescens* 200C

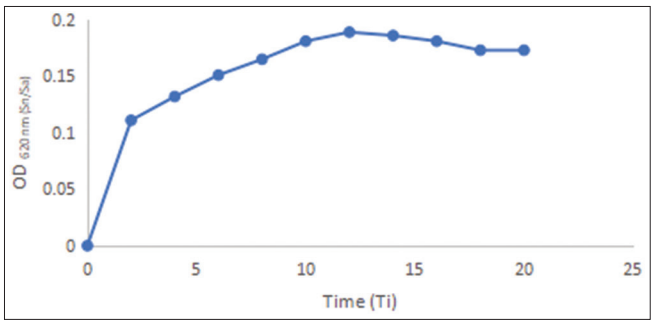

Figure 3: *In vitro Calcium oxalate* crystallisation with 50% *Ethanol* control

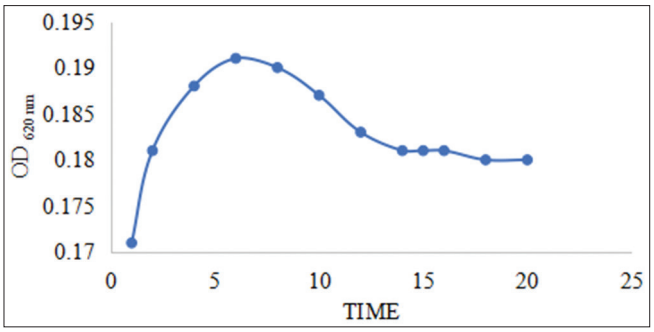

Figure 4: Effect of *Hydrangea arborescens* (Q 50 µl) on *in vitro Calcium oxalate* crystallisation

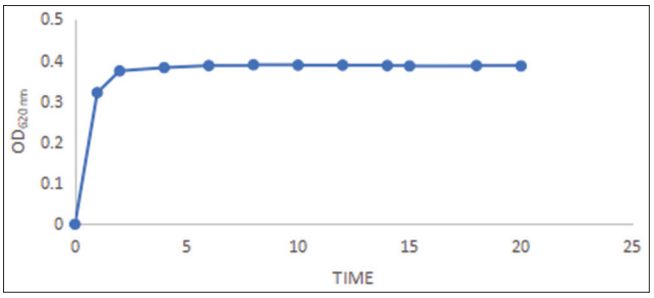

Figure 5: Effect of *Hydrangea arborescens* 6C 50 µl on *in vitro Calcium oxalate* crystallisation

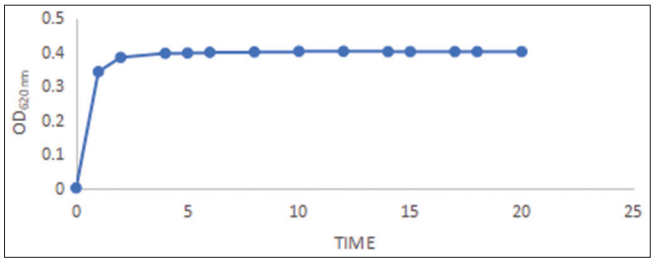

Figure 6: Effect of *Hydrangea arborescens* 30C 50 µl on *in vitro Calcium oxalate* crystallisation

In a test tube containing 1 ml of solution A, 1 ml of solution B was added, 1 drop of the suspension formed was spread on a glass slide, and a cover slip was placed on it and investigated under light microscope (light inverted microscope) and was photographed at ×40 magnification. The same procedure was repeated by adding Ethanol 50% (50 µl), *Hydrang. Q* (50 µl), *Hydrang.* 6C (50 µl), *Hydrang.* 30C (50 µl) and *Hydrang.* 200C (50 µl).

Results

Nucleation and aggregation assay

The maximum OD was obtained at 620 nm of these solutions, viz. control Ethanol 50% (50 µl), *Hydrang*. Q (50 µl), *Hydrang*. 6C (50 µl), *Hydrang*. 30C (50 µl) and *Hydrang*. 200C (50 µl). Graph of OD and different time intervals is plotted to show nucleation and aggregation. The OD increased linearly initially, which indicated the nucleation process and then decreased linearly indicating the aggregation process. *Hydrang.* 6C, 30C and 200C has inhibited both the rate of nucleation and the rate of aggregation. The maximum OD of the solutions, viz. control Ethanol 50%(50 µl) was 0.189, *Hydrang. Q* (50 µl) was 0.191, *Hydrang.* 6C (50 µl) was 0.389, *Hydrang.* 30C (50 µl) was 0.402 and *Hydrang.* 200C (50 µl) was 0.524. The nucleation and aggregation of CaOx crystals [Figure 1] [Table 1]. The photographs of the CaOx crystals, in solutions of control Ethanol 50%, *Hydrang. Q* (50 µl) shows aggregation, *Hydrang.* 6C (50 µl), *Hydrang.* 30C (50 µl) and *Hydrang.* 200C (50 µl) showed that CaOx crystals were decreased in *Hydrang.* 6C, 30C and 200C (50 µl) [Figure 2]. Mother tincture, i.e. *Hydrang*. Q, favours aggregation to greater extent by showing the inhibition of about −15% for aggregation hence favours crystal formation, and 6C was 13.70%, 30C was 42.30% and 200C was 14.90%, showing inhibitory nature for aggregation, with maximum inhibition shown by *Hydrang* 30C [Table 2].

Discussion

As CaOx is the most common renal stone found in the urine; the inhibitors of CaOx crystallisation are used as a prophylactic agent to prevent them.

We used a classical model of sample supersaturated with Calcium chloride and Potassium oxalate to determine the growth and aggregation of CaOx crystals. The normal human urine is not a static solution, as new solutes are constantly being added and subtracted from the solution. However, it is difficult to mimic the urinary tract *in vitro*, but the growth of crystals in synthetic urine in a static environment can be useful to some extent for explaining the formation of urinary calculi.[14] As homoeopathic mother tincture is not potentised, it shows crystal formation and favours crystallisation, while the homoeopathic dilutions of 6C, 30C and 200C potency are potentised and have a dynamic action, so they inhibit crystal formation so can be used to prevent the formation of the urinary CaOx calculi.

Table 1: Optical density values and time taken to induce the formation of detectable crystals, nucleation phase attained by saturated sample, *Hydrangea arborescens* Q, 6C, 30C and 200C and aggregation phase attained by saturated sample and *Hydrangea arborescens* Q

Sample	Time in seconds	OD values
Saturated sample of *Calcium chloride* and *Potassium oxalate*	14	0.024
Mother tincture in saturated sample	14	0.181
6C in saturated sample	12	0.386
30C in saturated sample	14	0.401
200C in saturated sample	14	0.523

OD: Optical density

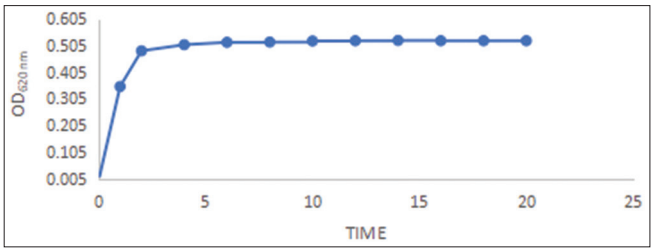

Figure 7 : Effect of *Hydrangea arborescens* 200C 50 µl on *in vitro* calcium oxalate crystallisation

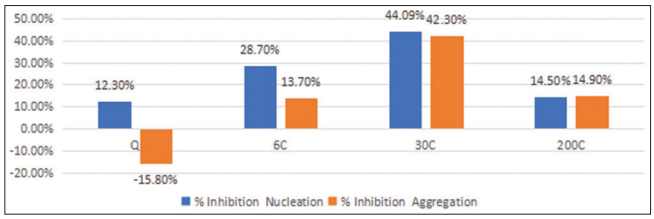

Figure 8: Percentage inhibition of nucleation and percentage inhibition of aggregation by *Hydrangea arborescens*

Table 2: Effect of *Hydrangea arborescens* potencies on *in vitro Calcium oxalate* nucleation and aggregation

Percentage inhibition exerted by *Hydrangea arborescens*		
50 µl each	**Nucleation (%)**	**Aggregation (%)**
Q	12.30	−15.80
6C	28.70	13.70
30C	44.09	42.30
200C	14.50	14.90

Several *in vitro* and *in vivo* studies[5,10,13,14] of medicinal substances have proved homoeopathic medicines play an important role in delaying and preventing the crystallisation process, thereby confirming these as suitable treatment for urolithiasis.

In Figure 1, the time required to form the CaOx crystals, at OD 620 nm, increase in slope indicates nucleation and reflects an increase in the size of particle, while decrease in slope indicates aggregation of CaOx crystals from a supersaturated solution. Measured parameters were induction time (Ti), i.e., time to induce formation of detectable particles, where Sn denotes slope of increase mainly due to crystal nucleation and Sa denotes slope of decrease due to crystal aggregation.

Figure 3 represents the in vitro CaOx crystallisation that was carried out with 50% Ethanol, unsuccessed which served as a control in the present study. The Ethanol was found to influence the CaOx crystallisation process. 50% unsuccessed Ethanol was used as control in the present study because 90% Ethanol favours crystallization process, as samples of Hydrang. Q, 6C, 30C and 200C each have different percentage of alcohol.

Figures 4-8 show the effect of *Hydrang*. homoeopathic preparation of *Q*, 6C, 30C and 200C, respectively, on the nucleation and aggregation of CaOx crystals.

Table 1 represents the effect of *Hydrang.* homoeopathic preparation on *in vitro* CaOx nucleation and aggregation [Figure 8].

Light microscopic studies

The formation of *in vitro* CaOx crystal was observed under microscope at ×40 magnification. The shapes of crystals observed were dumbbell, donut, needles, arborescent, platy, rosette, round edges and prismatic crystals of COM crystals. Some Calcium oxalate dihydrate crystals having tetragonal bipyramidal shape were also observed. The crystal collision results in the formation of numerous agglomerates and aggregates, which indicates major contribution of COM crystals in kidney stone formation [Figure 2], whereas in other slides with *Hydrang.* (6C, 30C and 200C), scanty crystals were observed and aggregation was also less.

Conclusion

The above study of *in vitro* crystallisation assays and microscopic observation demonstrates the possibility to dissolve CaOx calculi in human beings, thereby inhibiting the crystalluria and its resultant injury. *Hydrang*. has a relative effect on the solubility of CaOx which has been determined in simple salt solutions; the exact combination of the factors that are responsible for variations in CaOx solubility in urine is yet insufficiently known. Hence, further studies are a must to conclude its modus operandi *in vivo* system.

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Drugs and chemicals: Homoeopathic preparation of *Hydrangea Arborescens* (∅, 6C, 30C and 200C) was procured from Dr Willmar Schwabe India Pvt Ltd. All other chemicals and reagents used were of analytical grade.

Conflicts of interest

None declared.

References

1. Alelign T, Petros B. Kidney stone disease: An update on current concepts. Adv Urol 2018;2018:3068365.

2. Romero V, Akpinar H, Assimos DG. Kidney stones: A global picture of prevalence, incidence, and associated risk factors. Rev Urol 2010;12:e86-96.
3. Finlayson B, Reid S. The expectation of free and fixed particles in urinary stone disease. Investigative Urol 1978;15:442-8.
4. Carvahlo M, Nakagawa Y. Urinary supersaturation and recurrence in nephrolithiasis. Int Braz J Urol 1999;25:475-9.
5. Nayak C, Amulya SR, Nayak C, Prusty U, Akshaya HA, Paital B. A case report of ureteric calculus treated with homoeopathic medicine, *H. arborescens* 30. Indo Am J Pharm Sci 2018;5:627-33.
6. Organ Remedies. Available from: https://www.owenhomoeopathics.com.au/wp-content/uploads/2016/10/OrganRemedies.pdf. [Last accessed on 2020 May 21].
7. Principles of Prescribing. Available from: https://www.nhp.gov.in/principles-of-prescribing_mtl. [Last accessed on 2020 May 21].
8. Boericke W. New Manual of Homoeopathic Materia Medica and Repertory. New Delhi: B. Jain Publishers; 2005. p. 421.
9. Hansen O. *H. arborescens.* Available from: https://homoeopathybooks.in/rare-homeopathic-remedies/hydrangea-arborescens-3/. [Last accessed on 2019 Jul 26].
10. Nazmul H, Emrul K, Jahangir A, Kamrul K. *Hydrangea arborescence* and *Berberis vulgaris* ease uretric calculi emission: Single case report. Int J Med Pharm Case Rep 2017;10:1-5.
11. Clarke JH. A Dictionary of Practical Materia Medica. Vol. 2. London: The Homoeopathic Publishing Company; 1902. p. 917-8.
12. Hess B, Jordi S, Zipperle L, Ettinger E, Giovanoli R. Citrate determines calcium oxalate crystallisation kinetics and crystal morphology-Studies in the presence of Tamm-Horsfall protein of a healthy subject and a severely recurrent calcium stone former. Nephrol Dial Transplant 2000;15:366-74.
13. Ganesan T, Ravi BD, Vasavan J. Homoeopathic preparation of *Berberis vulgaris* as an inhibitor of calcium oxalate crystallisation: An *in vitro* evidence. Indian J Res Homoeopathy 2015;9:152-7.
14. Saha S, Ramtej J. Verma; inhibition of calcium oxalate crystallisation *in vitro* by an extract of *Bergenia ciliate*. Arab J Urol 2013;2:187-92.

हाइड्रेंजिया आर्बोरेसैन्सि, होम्योपैथिक दवा का कैल्शियम ऑक्सलेट रवाकरण के प्रावरोधक के तौर पर एक इन विट्रो अध्ययन

पृष्ठभूमि: होम्योपैथिक मूल अपमिश्रण हाइड्रेंजिया आर्बोरेसैन्सि, का परंपरागत तौर पर मूत्रीय समस्याओं जैसे मूत्रमार्ग में संक्रमण, गुर्दे में पथरी, प्रॉस्टेट की अतिवृद्धि इत्यादि में इस्तेमाल होता है। हालांकि शिकायतों के निराकरण के लिए इसकी प्रक्रिया का तरीका अनिश्चित बना हुआ है। इस अध्ययन को हाइड्रेंजिया के होम्योपैथिक विरचनों का यूरोलिथियासिस (कैल्शियम ऑक्सलेट रवाकरण) पर पड़ने वाले इन विट्रो प्रभाव को जांचने के लिए अभिकल्पित किया गया है। **उद्देश्य:** हाइड्रेंजिया, एक इन विट्रो कैल्शियम ऑक्सलेट रवाकरण में एक होम्योपैथिक विरचन की संभाव्य भूमिका का विश्लेषण। **प्रणालियाँ एवं सामग्रियाँ:** स्पेक्ट्रोफोटोमेट्रिक क्रिस्टलीकरण जांच को संचालित किया गया तथा रैखिक समाश्रयण विश्लेषण का इस्तेमाल करते हुए न्यूकलिएशन और एकत्रीकरण चरणों के झुकावों की गणना की गई थी तथा हाइड्रेंजिया क्यू, 6सी, 30सी और 200 सी द्वारा काम में लाए गए प्रावरोध प्रतिषत की गणना की गई थी। हाइड्रेंजिया क्यू, 6सी, 30सी और 200 सी की अनुपस्थिति तथा मौजूदगी में कैल्शियम ऑक्सलेट के मणिभों का अति सूक्ष्म अवलोकन स्पेक्ट्रोफोटोमेट्रिक क्रिस्टलीकरण जांच को प्रमाणित करने के लिए संचालित किया गया था। **परिणाम:** संपादित किए गए क्रिस्टलीकरण अध्ययनों ने हाइड्रेंजिया को न्यूक्लिेशन और एकत्रीकरण दोनों स्तर पर कैल्शियम ऑक्सलेट क्रिस्टलीकरण के विरुद्ध एक प्रभावकारी दवा के तौर पर दर्शाया। क्यू द्वारा तकरीबन 15 प्रतिशत अवरोधन दर्शाते हुए समूहन को काफी हद तक सहायता प्रदान की जाती है; जबकि 6सी,30सी और 200सी के लिए, अवरोधन प्रतिशत क्रमशः 13.70 प्रतिषत, 42.30 प्रतिशत और 14.90 प्रतिशत था। यह एकत्रीकरण के लिए प्रावरोध विधि को दर्शाता है, जिसमें हाइड्रेंजिया 30 सी प्रभाव द्वारा उच्चतम प्रावरोध दर्षाया गया। **निष्कर्ष:** हाइड्रेंजिया का होम्योपैथिक विरचन, पथरी बनने की मुख्य घटनाओं को रोकता है। उपरोक्त परीक्षण की खोजों ने हाइड्रेंजिया की उपयोगिता को गुर्दे की कैल्कुली के मामलों में समर्थित करने के प्रमाण को दर्शाया है।

Une étude in vitro d'Hydrangea arborescens, préparation homéopathique comme inhibiteur de la cristallisation de l'oxalate de calcium.

Contexte: La teinture mère homéopathique Hydrangea arborescens (Hydrang.), est traditionnellement utilisée pour les plaintes urinaires comme les infections des voies urinaires, les calculs rénaux, l'hypertrophie de la prostate, etc. Cependant, son mode d'action pour l'annihilation des plaintes reste incertain. Cette étude a été conçue pour étudier l'effet in vitro des préparations homéopathiques de Hydrang. sur l'urolithiase (cristallisation de l'oxalate de calcium). **Objectif:** Analyse du rôle potentiel de Hydrang, une préparation homéopathique dans une cristallisation in vitro d'oxalate de calcium. **Les méthodes et les Matériaux:** Un essai de cristallisation spectrophotométrique a été effectué et les pentes des phases de nucléation et d'agrégation ont été calculées en utilisant une analyse de régression linéaire et le pourcentage d'inhibition exercé par l'Hydrang. Q, 6C, 30C et 200C ont été calculés. Des observations microscopiques de cristaux d'oxalate de calcium ont été effectuées en présence et en l'absence d'Hydrang. Q, 6C, 30C et 200C pour étayer l'essai de cristallisation spectrophotométrique. **Résultats:** Les études de cristallisation effectuées indiquent que l'Hydrang. est un puissant médicament contre la cristallisation de l'oxalate de calcium, tant au niveau de la nucléation que de l'agrégation. Hydrang. Q favorise l'agrégation dans une large mesure en montrant une inhibition d'environ 15% ; alors que pour 6C, 30C et 200C, le pourcentage d'inhibition était de 13,70%, 42,30% et 14,90% respectivement. Cela montre la nature inhibitrice de l'agrégation, l'inhibition maximale étant démontrée par Hydrang. 30C. **Le Conclusion:** Les préparations homéopathiques de l'Hydrang. inhibent les événements primaires de la formation de la pierre. Les résultats de l'expérience ci-dessus montrent les preuves de l'utilité de l'Hydrang. dans les cas de calculs rénaux.

Estudio in vitro de Hydrangea arborescens, preparación homeopática como inhibidor de la cristalización del oxalato de calcio.

Antecedente: Tintura madre homoeopática *Hydrangea arborescens (Hydrang*.), se utiliza tradicionalmente para las quejas urinarias como la infección del tracto urinario, cálculos renales, hipertrofia de próstata, etc. sin embargo, el modo de su acción para la aniquilación de las quejas sigue siendo incierto. Este estudio fue diseñado para investigar el efecto in vitro de los preparados homeopáticos de Hydrang sobre la urolitiasis (cristalización de oxalato de calcio). **Objetivo:** Análisis del papel potencial de *Hydrang*., una preparación homoeopática en cristalización de oxalato de calcio in vitro. **Métodos y materiales:** Se realizó un ensayo de cristalización espectrofotométrica y se calcularon las pendientes de las fases de nucleación y agregación mediante análisis de regresión lineal y el porcentaje de inhibición ejercido por el *Hydrang*. Se calcularon Q, 6C, 30C y 200C. Se realizaron observaciones microscópicas de cristales de oxalato de calcio en presencia y ausencia de *Hydrang. Q,* 6C, 30C y 200C para apoyar el ensayo de cristalización espectrofotométrica. **Resultados:** Los estudios de cristalización realizados indican que Hydrang es un medicamento potente contra la cristalización del oxalato de calcio tanto a nivel de nucleación como de agregación. Hydrang. Q favorece la agregación en gran medida al mostrar la inhibición de alrededor del 15%; mientras que para 6C, 30C y 200C, el porcentaje de inhibición fue del 13.70%, 42.30% y 14.90% respectivamente. Esto muestra la naturaleza inhibitoria de la agregación, con la máxima inhibición que muestra Hydrang. Potencia 30C. **Conclusión:** Las preparaciones homoeopáticas del Hydrang, inhiben los eventos primarios de la formación de piedras. Los hallazgos del experimento anterior muestran la evidencia para apoyar la utilidad de *Hydrang*. En los casos de cálculo renal.

Eine In-Vitro-Studie von Hortensien arborescens, homöopathische Zubereitung als Inhibitor der Calciumoxalatkristallisation.

Hintergrund: Homöopathische Urtinktur Hydrangea arborescens (Hydrang.), wird traditionell für Harnwegsbeschwerden wie Harnwegsinfektionen, Nierensteine, Prostatahypertrophie usw. verwendet. Die Art ihres Handelns zur Vernichtung von Beschwerden bleibt jedoch ungewiss. Diese Studie wurde entwickelt, um in vitro Wirkung von homöopathischen Präparaten von Hydrang zu untersuchen. auf urolithiasis (calcium-Oxalat-Kristallbildung). **Zielsetzung:** Analyse der potenziellen Rolle von Hydrang., ein homöopathisches Präparat in einer in vitro Calciumoxalatkristallisation. **Methoden und Materialien:** Der spektrophotometrische Kristallisationstest wurde durchgeführt und die Steigungen der Kern-und Aggregationsphasen wurden unter Verwendung der linearen Regressionsanalyse und der prozentualen Hemmung durch den Hydrang berechnet. Q, 6C, 30C und 200C wurden berechnet. Mikroskopische Beobachtungen von Kristallen von Calciumoxalat wurden in Gegenwart und in Abwesenheit von Hydrang durchgeführt. Q, 6C, 30C und 200C zur Unterstützung des spektrophotometrischen Kristallisationsassays. **Ergebnisse:** Die durchgeführten Kristallisationsstudien deuten auf Hydrang hin. ein wirksames Medikament gegen Calciumoxalatkristallisation sowohl auf der Ebene der Keimbildung als auch der Aggregation zu sein. Hydrang. Q begünstigt die Aggregation in hohem Maße, indem es die Hemmung von etwa 15% zeigt; während für 6C, 30C und 200C die prozentuale Hemmung 13,70%, 42,30% bzw. Dies zeigt eine hemmende Natur für die Aggregation, wobei die maximale Hemmung durch Hydrang gezeigt wird. 30C Potenz. **Schlussfolgerung:** Die homöopathischen Präparate des Hydrang., hemmen die primären Ereignisse der Steinbildung. Die Ergebnisse des obigen Experiments zeigen die Beweise für die Nützlichkeit von Hydrang. in den Fällen von Nierensteinen.

绣球花树莓的体外研究，顺势疗法制剂作为草酸钙结晶的抑制剂。

背景: 顺势疗法母亲酊绣球花树木（绣球花。），传统上用于尿路感染，肾结石，前列腺肥大等尿投诉。 然而，其消除投诉的行动方式仍然不确定。 本研究旨在研究绣球花顺势疗法制剂的体外效果。 尿路结石（草酸钙结晶）。目标: 绣球花的潜在作用分析。，在体外草酸钙结晶顺势制备。方法和材料: 进行了分光光度法结晶测定和成核和聚集阶段的斜坡计算使用线性回归分析和绣球花施加的百分比抑制。 Q、6C、30C和200C进行计算。草酸钙晶体的微观观察是在存在和没有绣球花的情况下进行的。 Q、6C、30C和200C支持分光光度法结晶测定。结果: 进行的结晶研究表明绣球花。 是对草酸钙结晶的有效药物，无论是在成核和聚集的水平。 绣球花 Q在很大程度上显示出约15％的抑制作用，而对于6C，30C和200C，抑制百分比分别为13.70％，42.30％和14.90％。 这显示了对聚集的抑制性质，具有通过绣球花显示的最大抑制。 30C效力。结论: 绣球花的顺势疗法制剂。，抑制石材形成的主要事件。 上述实验的结果表明，支持绣球花的有用性的证据。 在肾结石的情况下。