EXPERIMENTAL INVESTIGATION ABOUT IRON CONTENT IN THE HERACLEUM PERSICUM

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ABSTRACT

In this research, the total iron content of cationic Heracleum in different conditions was studied. Several examples of this plant is quite Persia in constant boiling temperature gradient and temperature conditions were prepared by atomic absorption spectrophotometer, the total iron content of samples was measured. The effect of pH, time, temperature and types of gradation on iron content of golpar was studied. The obtained data suggest that different factors were effective on iron content so that adjusting the pH conditions, aggregation and temperature profile(constant temperature or temperature gradient) increase or reduce the total concentration of iron in the final solution.

1. INTRODUCTION

In 1385, Falah and colleagues, Effect of iron and zinc supplementation alone and combined, on iron and zinc status in elementary school children examined [21]. The study was conducted double-blind clinical trial of 81 Fifth grade primary school students were divided into three groups the city of Khorramabad. The first group received iron supplements (20 mg iron per day), the second group with zinc (20 mg zinc per day) and the third group Fe + Zn supplementation (20 mg zinc + 20 mg iron) for 4 months. At the beginning and end of the intervention with a cell counter parameters of hemoglobin, serum ferritin radioimmunoassay using the device Gamakantr and zinc were measured by atomic absorption spectrophotometry. Tests, ANOVA, t-test, Kruskal-Wallis and Wilcoxon tests were used for analyzing of the data. Obtained results showed that the group receiving zinc alone, zinc and iron with iron alone increased serum zinc levels compared to the previous. Children who most benefit from zinc deficiency zinc supplementation in all three groups survived. Iron taking supplements alone caused an increase plasma ferritin. Supplements of iron zinc and blood hemoglobin had no significant effect on the combination of these two. Finally Iron Supplementation with zinc to improve the plasma iron parameters and serum zinc, more appropriate than taking individually each of them [21]. In 1383, Noble and colleagues, iron and zinc levels in people infested with giardiasis in children less than 12 years were examined [22]. Giardia is one of the most common human intestinal parasites, especially in children who plays a role in malnutrition. The concentration of Giardia in the intestine, causing malabsorption of nutrients and damage to the lining of the duodenum and jejunal cells and to be especially impaired absorption of iron and zinc. In a case-control study, using direct methods and formalin ether stool, giardiasis, 100 children under age 12 who were not suffering from any disease or another infection (cases) and 100 healthy children in terms of clinical and laboratory testing were (control) were selected. All control children matched for age, sex, height and weight were matched. Concentration of Zn and iron were measured by atomic absorption spectrometry by Atomic absorption. The Z value was calculated by t-test. As a result, the amount of zinc and serum iron children less than 12 years old with Giardia Lamblia in this research were less than healthy children [22].

Sgprnah and colleagues in 2012, Heracleum persicum began to examine the characteristics of the medicinal plant. Heracleum persicum plant is known as an Iranian plant. Heracleum persicum extract and oil are the main plant in the production medicinal drugs in many activities in the Middle East, especially Iran [23]. Heracleum persicum for a long time in traditional medicine to relieve flatulence, abdominal pain, digesting and antiseptic also used to work. Antioxidant properties, anticonvulsant, analgesic, anti-corruption and strengthening the immune system have recently been identified in Heracleum persicum. Pimpineillin, ISO Pimpineillin, fully or partially, Bergaptin, ISO Isobergaptin, Sphondin, furanocoumarin that have been reported in the root of the plant. Hazel butyrate, ethyl acetate and 2-ethyl-Agzy1 Butanat as major components of the oils were identified of Heracleum persicum. In the plant and easy collect of extensive and outstanding biological activities of this plant as a food and medicines are used [23].
In 2009, Sharifi Far and colleagues, the effect of aqueous extract of Heracleum persicum for dampen immune activity were examined. Immunomodulatory activity of aqueous doses of Heracleum persicum extract in Swiss white mice was examined. Mice at doses of 50, 100 and 200 kg were treated for 5 days. In the experiment, body weight, relative organ to body weight, delayed hypersensitivity reactions, and hemagglutinin titer (antibodies blood clotting) in different groups of animals were studied. Results obtained demonstrated significant increases in relative weights members of the liver and spleen at doses of 50 and 100 kg respectively. However, there is no increase in the enzymes level of liver and enzymes of kidney at the tested doses, relative to the plants. Heracleum persicum extract showed a significant increase in delayed hypersensitivity reactions in doses of 100 and 200 mg / kg. In tests, stimulatory effect of vent hoods in all doses hemagglutinin titer was, however, were notable changes in the doses of 50 and 100. Deaths not happen at doses tested. Stimulatory effect on cellular and humoral immune function in mice is demonstrated, in total Heracleum persicum [9].

In 2011, Ms. Hemmati and colleagues studied the effects of Heracleum persicum and folliculogenesis on the ovarian tissue [11]. Use of Heracleum persicum traditionally recommended as a contraceptive for women. In this study, hydro alcoholics Heracleum persicum extract was injected at doses of 400 and 1600 mg kg in female rats for 21 days. At the end of the infusion period was provided as a result of ovarian samples for histological study. FSH test was performed according to the method of chemical Decay. The data was analysed by the Instat3 and ANOVA.

In experimental group, the number of primary follicles increased, while the number of mature follicles (Mature) decreased. This study provides preliminary data on the effects of Heracleum persicum extract in vivo cellular environment on ovarian follicles in female rats. The results showed that administration of ethanol extracts of Heracleum persicum, may have an inhibitory effect on follicle formation and may cause infertility in females [11]. In 1384, Ali Nazmi and his colleagues, Antimicrobial properties of aqueous and methanol extracts of fruits Iranian Heracleum persicum studied in outside the body cellular environment. In this case-control study was conducted, Was evaluated antimicrobial activity of the extracts against 14 bacterial and two fungal species.

2.1 Solution Construction:
Caustic 0.5 M: 2 g gains in volume 100 ml balloons were brought to volume with distillation water 2bar. molar solution of HCl 1/0: M HCl 1/0 Tytrazul standard solution in 1000 ml volumetric balloons was brought to volume with distillation water 2bar.
Solution of Frick chloride solution of Frick chloride at a concentration of 5 ppm, 10 ppm, 20 ppm, 50 ppm, 100 ppm in 100-mL volumetric balloons was made to calibrate the atomic absorption spectrophotometer.

2.2 Efficiency Devices
In of this study, the PH meter [Model 744] Metrohom to measure the PH of the solution, a magnetic stirrer [Model ZMS 74] for mixing and uniform solution, digital scale with a precision of one ten-thousandth [Model HR-2000] to measure materials by atomic absorption spectrometry [model Perkin Elmer AAnalyses300] to measure the amount of iron in solution, LANSHAN device is used to obtain the solution and distilled water 2bar.

2.3. Supplying solutions in different circumstances of Heracleum persicum
In this study, the effects of time, temperature, pH and particle size of the plant on the Heracleum persicum plant soluble were investigated. Content Heracleum persicum metrics and general characteristics placed 12 gr of dried herb in 120 ml of distilled water.
2.4. Sample preparation temperature gradient

Different samples of the solutions Heracleum persicum called the temperature gradient samples with boiling water, pH casually, without changing the conventional granulation plant, which was prepared in this way, plants weighed 12 g, and 120 mL of water boiling distilled water containing within the plant was kept Average length of time of 10, 30, 60, 90, 150, and 180 minutes on a laboratory table. Each of solution after the desired time has elapsed, by filter paper; smooth substrate solution was stored in sealed containers to measure the dark. Also, if the filter sample size was less than 120 ml, the volume was completed with distilled water to 120 ml. Also, in order to control the entire process from which the sample was prepared in distilled water, the sample container was kept as a control sample.

2.5. Fixed samples were supplying boiling

In order to supplying a constant boiling point samples in 120 ml of boiling distilled water, 12 g of Heracleum persicum plant was added, and again was placed over the flame to boil water for the desired time. For prevent evaporation of water sample was placed on a watch glass boiling. All samples were filtered with a desired time very rapid and the samples were kept under the filter as before, kept in specific containers with complete specifications.

2.6. Preparation of samples at different granulation

In order to study the effect of aggregation, ie, small and large primary particles Heracleum persicum plant, this plant was used in three types of granulation which are original sample granulation, medium granulation and small granulation. Granulation criteria were considered judgment the eye. The average granulation of the plant to produce a decent amount of Masonry mortar was poured and a little soft, so far as it was possible to preparation of fine grained powder of the plant in a mortar. By any of aggregation, the solution boiling point temperature gradient is constant and equal to 90 minutes in duration, with three acidic pH (pH = 3), neutral (pH = 7) and alkaline (pH = 10) was prepared.

2.6. Cationic iron content of measured in all samples

In order to measure the total metal cation content of the samples prepared at different conditions were analyzed by atomic absorption of Heracleum persicum. To do this, using standard solutions of iron, drawing the calibration curve was and then measuring the absorbance of each solution were calculated using the calibration equation.

3. Results and Discussion

Effect of constant boiling temperature and temperature gradients as well as pH, time and aggregation were studied in the iron content of the products from the plant Heracleum persicum. To the constant boiling temperature is typical For certain time period Heraclleum persicum at boiling (boiling water) kept at various time intervals, samples were removed from the flame and the supernatant was separated and cooled. The temperature gradient in the sample Heracleum persicum in boiling water and water from the flame is removed and the soluble allowed cooling, this is like a tea brewing.

3.1. Measurement of total iron content in the solution Heraclleum

In order to measure the total iron content, the iron standard samples were made using FeCl3 salt and using an atomic absorption spectrophotometer, amount absorbance of samples became measured and plotted graphs Calibration. In Figure 4.1, the equation of the calibration curve of iron are:

$$y = 0.0106x + 0.0145$$

Figure 4.1 Calibration curve and equation for iron

3.3. Effect on total iron content of the solution with temperature gradient from hot to room Heraclleum

To evaluate the effect of the iron content of of plant solutions Heracleum persicum, Heracleum persicum amount 12 g of completely dry plant in 120 ml of boiling distilled water is added, And within the in a lab environment release and after the transition timescales to smooth the solution designated. Filter below solution with distilled water and brought to a volume of 120 ml After reaching the temperature of the solution to room temperature, of soluble iron absorption measured by atomic absorption Using the calibration chart, the concentration was calculated. The data are shown in Figure 4.2.
Accordin to the data obtained, the concentration of iron in solution Heracleum persicum temperature gradient is mode, so I was very low and then increased minutes. And 100 minutes after the changes is insignificant. In other words, to extract the maximum amount of iron in the temperature gradient is of the Heracleum persicum plant, the best time is 100 minutes.

3.3. Effect on total iron content of Heracleum persicum a constant temperature of boiling

In order to evaluate the effect on Heracleum persicum solutions prepared from boiling water; Heracleum persicum 12 gr amount completely dry plant to 120 ml of boiling distilled water added, The container is kept boiling on the gas lights and after passing a specified time interval, Heracleum persicum soluble boiling filtered, and the filtrate solution brought to 120 ml with distilled water and the temperature of the solution to reach room temperature, iron the amount of, were measured. Relevant data are shown in Figure 4-3.

According to the the data obtained in Figure 4-3, in a state of constant boiling point, Amount of total iron in solution from the beginning is higher than the temperature gradient. Also in the case of a constant boiling point, the amount of iron in solution rapidly and reached saturation after 30 minutes. By comparing the effect of time together, it can be concluded that if the iron content of solution is desired Heracleum persicum, constant boiling point method is better because it provides more concentration and faster saturation is reached.

3.4. Investigate the effect pH on the iron content of in the temperature gradient and the constant boiling point

To evaluate the effect of pH on the total iron the content, the amount of 12 g of completely dry plant Heracleum persicum to 120 ml of water with different pH (pH of the solution by HCl and NaOH in quantities of 1, 3, 5, 7, 9, 11 and 13 set.) are boiling, and the temperature gradient of the sample collection period of 90 min. Then the sample temperature to reach room temperature by atomic absorption spectrophotometer analysis was performed and the data were plotted in Figure 4-4.

According to the data obtained for the pH effect on the iron content of solution and plant Heracleum persicum temperature gradient mode after 90 minutes.
From the above graph it can be concluded that after 90 min of extraction of iron from plant tissue *Heracleum persicum* temperature gradient method, maximum concentration the very acidic pH, of iron content in the solution decreases with increasing pH, probably because of the formation of iron hydroxide and iron out a solution.

3.5. Investigation the effect of pH on iron the content in constant boiling point

To evaluate the effect of pH on the total iron the content, the amount of 12 g of completely dry plant *Heracleum persicum* to 120 ml of water with different pH (pH of the solution by HCl and NaOH in quantities of 1, 3, 5, 7, 9, 11 and 13 is set) is added to boiling, and a constant boiling point samples for 90 min. After isolating sample temperature to reach room temperature by atomic absorption spectrophotometer analysis was performed and data were plotted in Figure 4-5.

![Figure 4.5 Effect of pH on cationic content of the total iron in solution Heracleum persicum constant boiling temperature after 90 minutes](image)

According to the data in Figure 4-5, it can be deduced that in the case of a constant boiling point, in acidic pH of less than 3 Maximum amount of iron extracted from the tissue *Heracleum persicum* done. Also at this pH relative to the temperature gradient, higher iron concentration is obtained.

3.6. Study of particle size (granulation) *Heracleum persicum* the total iron content of the In the temperature gradient and the constant boiling point

To determine the iron content of the of the granulation plant *Heracleum persicum*, *Heracleum persicum* solutions In different pH of raw water (including pH of 3, 7 and 10) as in the previous period of 90 min. Natural approximate aggregation In three sizes, ordinary (OG) medium (MG), or fine powder (SG) was used. It was done by a mortar fragment. Corresponding to the data measured by atomic absorption spectrophotometer after in Figure 4-6 (temperature gradient) and 4-7 (constant boiling point) were drawn.

![Figure 4.6 Grain size effect on total iron the content of In temperature gradient mode, after 90 minutes at different pH](image)

According to the data obtained for the effect of gradation on the total iron content of the in the temperature gradient, the role of aggregation is quite evident. The finer the granulation plant *Heracleum persicum*, the removal of iron from the tissues increases. With increasing pH in all three types of aggregation, reduction in iron concentration was observed, due to the creation and removal of iron hydroxide is soluble.

![Figure 4-7 aggregation impact on total iron the content of in the case of a constant boiling point, after 90 min at different pH](image)
By examining the impact the data granulation on the iron the content of in the case of a constant boiling point, the conclusion that aggregation in constant boiling point little effect on the total soluble iron the content of is. Systematic decrease with increasing pH and total dissolved iron the similar content in all three types of granulation was observed. Since these cases produce iron hydroxide and iron.

CONCLUSIONS
In the research reported here the effects of different conditions the content of soluble iron on Heracleum persicum were studied. The data suggests that this plant has a pretty decent amount of iron. The survey conducted showed that changing circumstances of the preparation soluble changed the content of cationic iron. This data can be a useful basis for the preparation of solutions of this plant contains significant amounts of iron for various purposes. In fact, given the data and adjustment conditions for the extraction iron from the plant introduces proper method which is much cheaper than the industrial methods of producing solutions of iron.

REFERENCES