

Раздел 5. «Химия»

МРНТИ 31.21.15

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(e-mail.ru: nyshanbay.aruzhan@internet.ru)***Development of technology of medicines based on hawthorn fruits and determination of its antioxidant activity**

Currently, herbal medicines have not lost their relevance in medical practice, as they have high biological activity. This allows them to be used for the prevention and treatment of many diseases. In the course of plant research, practical interest was aroused by the fruit of hawthorn as a promising medicinal plant, the composition of which is rich in biologically active substances, belonging to the rosaceae group. The plant species of this group growing in Kazakhstan have not been systematically studied.

For this reason, hawthorn fruits are a source of powerful antioxidant compounds found in plants. Antioxidants neutralize unstable molecules called free radicals, which cause high damage to our organism. The activity of hawthorn as an antioxidant reduces the risk of certain types of cancer, diabetes, asthma, heart problems, premature skin aging. The effect of hawthorn will be twice as strong if it is prepared on the basis of ethanol.

Keywords: Hawthorn, spectrophotometry, voltammetric complex, concentration, antioxidant activity, ethyl alcohol.

Introduction

The hawthorn fruit is considered one of the fruits rich in biological activity and pharmacological properties. Performs the role of an antioxidant, being a restorer of some metabolic processes.

The main purpose of the work is to study their antioxidant activity with the production of an alcoholic extract of hawthorn fruits under different conditions, that is, at different temperatures and concentrations. After the experimental work, the development of technology of medicinal products from the extract showing high antioxidant activity in the future.

In the course of the work, comparative studies are conducted with ascorbic acid in order to clearly see the antioxidant activity of hawthorn fruit extract. The reason is that ascorbic acid has a very high antioxidant activity due to the vitamin C contained in it.

A spectrophotometer was used to determine the concentration of extracts and a voltammetric device STA was used to study their antioxidant activity.

Experimental part:

First of all, 50 g of dried hawthorn plant is taken and finely crushed. Ready ground hawthorn fruits:

1) 40°C, 35 min, C=50%

2) 40°C, 35 min, C=70%

3) 60°C, 35 min, C=50%

4) 60°C, 35 min, C=70%, extraction was carried out at two degrees, two different concentrations of ethyl alcohol, using a reflux condenser.

Work was carried out to determine the concentration of hawthorn with the production of ascorbic acid as a reference using a spectrophotometer of the finished extract. Figures 1, 2, 3, 4 show the results of the study.

Раздел 5. «Химия»



Figure 1. Alcohol extract obtained at 40°C, 35 min, C = 50%



Figure 2. Alcohol extract obtained at 40°C, 35 min, C = 70%



Figure 3. Alcohol extract obtained at 60°C, 35 min, C = 50%



Figure 4. Alcohol extract obtained at 60°C, 35 min, C = 70%

The antioxidant activity of plant extracts of ascorbic acid and hawthorn, isolated in 4 cases and at established concentrations, was determined by the voltammetric method. The result of the study of ascorbic acid $K = 4.81792$ (Figure 5).

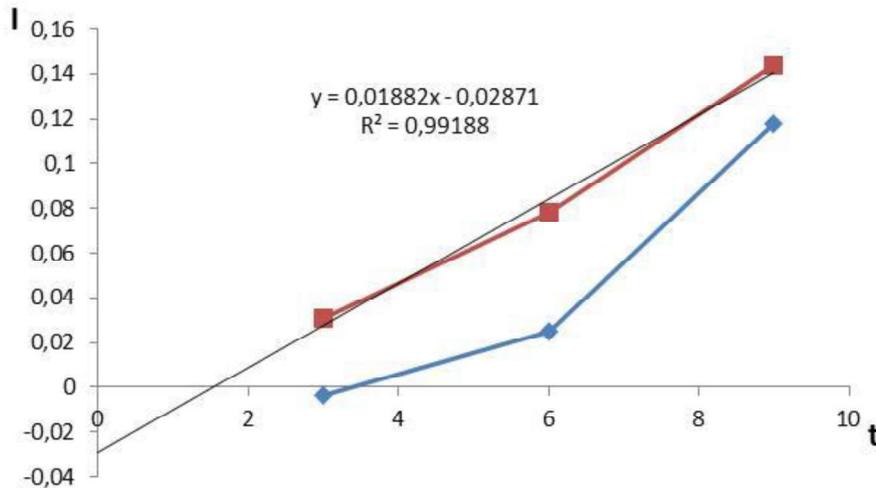


Figure-5. Voltammetric dependence of the antioxidant activity of ascorbic acid

With the help of voltammetry, the antioxidant activity of hawthorn was detected. Studies of extracts obtained under four different conditions are presented in Table 1. Sample 1 showed a high indicator of antioxidant activity (Figure-6)

Раздел 5. «Химия»

Table -1. Hawthorn fruit sample taken with a voltammeter

№	Extraction conditions	Coefficient of antioxidant activity (K)
1	40°C,35 мин,С=50%	21,19168
2	40°C,35 мин,С=70%	19,84768
3	60°C,35 мин,С=50%	19,73248
4	60°C,35 мин,С=70%	19,40992

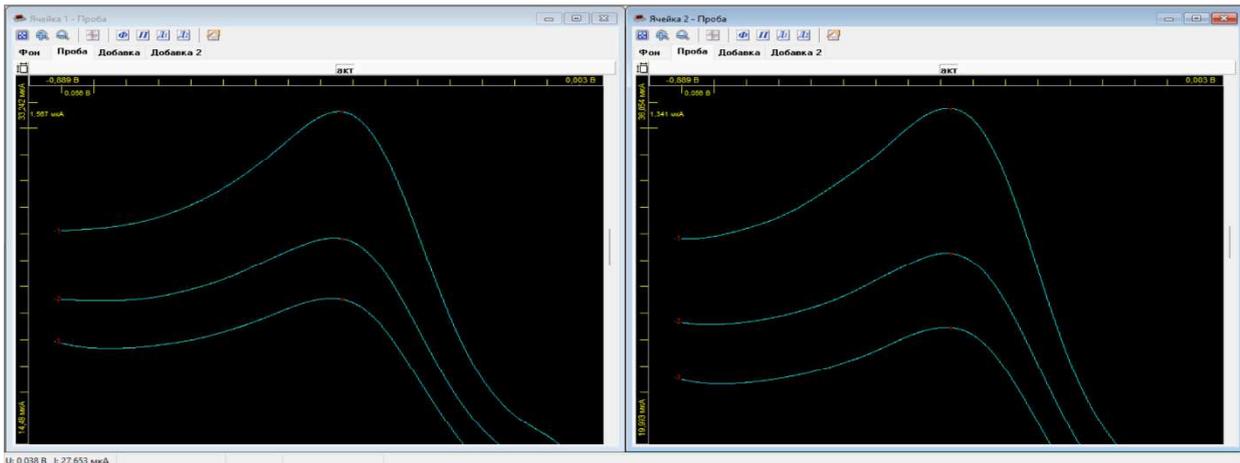


Figure-7 . Voltammogram of sample 1

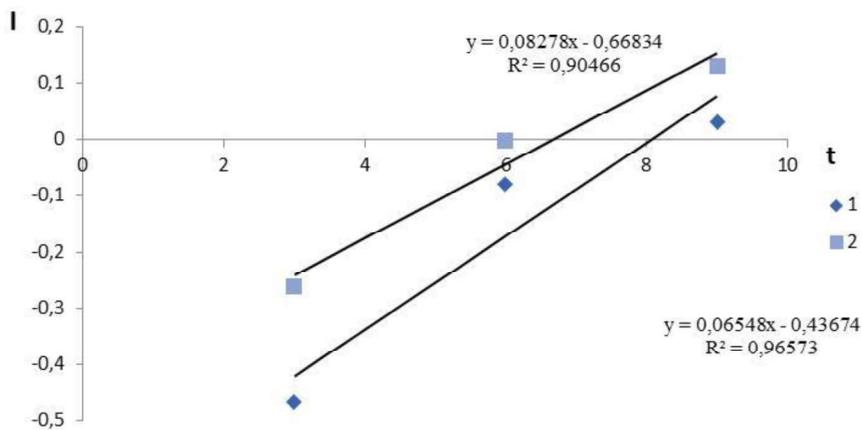


Figure 8. Sample result-1

In the course of research work on the device, the complex voltammetric CTA hawthorn fruit extract, obtained at a temperature of 40 degrees 35 minutes 50%, showed high antioxidant performance compared to k = 21.19168, ascorbic acid k = 4.81792, sample 1.

Conclusion

A review of the literature has shown that hawthorn fruits are the basis of powerful antioxidant compounds. A lot of research has been carried out on this fact, goals have been set. In order to show a high

Раздел 5. «Химия»

indicator, samples were taken under various conditions, studies were conducted by the voltammetric method on antioxidant activity.

Summing up the results of the research, it should be noted that due to the high antioxidant activity of the hawthorn plant, the main goal is to develop a technology of medicines based on this fruit.

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Долана жемістеріне негізделген дәрілік заттардың технологиясын жасау және оның антиоксиданттық белсенділігін анықтау

Қазіргі таңда өсімдік тектес дәрілік заттар медициналық практикада өз өзектілігін жоғалтпаған, себебі олардың биологиялық белсенділігі жоғары. Бұл оларды көптеген аурулардың алдын алу және емдеу үшін пайдалануға мүмкіндік береді. Өсімдіктерді зерттеу барысында құрамы биологиялық белсенді заттарға бай, раушангүлділер тобына жататын, перспективті дәрілік өсімдік ретінде кәдімгі долана жемісі практикалық түрде қызығушылық туғызды. Осы топтағы өсімдіктердің Қазақстанда өсетін түрлері жүйелі түрде зерттелмеген.

Осы себепті долана жемісі өсімдіктерде кездесетін күшті антиоксиданттық қосылыстардың қайнар көзі болып табылады. Антиоксиданттар біздің денемізге жоғары деңгейде зиян келтіретін бос радикалдар деп аталатын тұрақсыз молекулаларды бейтараптандырады. Долана антиоксидант ретіндегі белсенділігі кейбір қатерлі ісіктердің, қант диабетінің, астманың, жүрек проблемаларының, терінің ерте қартаюының қаупін төмендетеді. Долананың этанол спирті негізінде дайындалған жағдайда әсері екі есе күшті болады.

Түйінді сөздер: Долана өсімдігі, спектофотометрия, вольтамперометриялық комплекс, концентрация, антиоксиданттық белсенділік, этил спирті.

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Разработка технологии и антиоксидантная активность лекарственных средств на основе плодов боярышника

В настоящее время лекарственные средства растительного происхождения не утратили своей актуальности в медицинской практике, так как обладают высокой биологической активностью. Это позволяет использовать их для профилактики и лечения многих

Раздел 5. «Химия»

заболеваний. В ходе исследований растений практический интерес вызвал плод боярышника как перспективное лекарственное растение, состав которого богат биологически активными веществами, относящиеся к группе розоцветных. Виды растений этой группы, произрастающие в Казахстане, систематически не изучались.

Плоды боярышника являются источником мощных антиоксидантных соединений, содержащихся в растениях. Антиоксиданты нейтрализуют нестабильные молекулы, называемые свободными радикалами, которые наносят высокий ущерб нашему организму. Активность боярышника как антиоксиданта снижает риск некоторых видов рака, диабета, астмы, проблем с сердцем, преждевременного старения кожи. Эффект боярышника в два раза сильнее, если его приготовить на основе этанольного спирта.

Ключевые слова: Боярышник, спектофотометрия, вольтамперометрический комплекс, концентрация, антиоксидантная активность, этиловый спирт.