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STUDYING THE QUANTITY OF MACRO AND MICRO ELEMENTS IN CASTORE AND FLAX SEEDS

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Annotation
In this article, samples of flax and castore plants growing on the territory of our Republic, taken in a 1:1 ratio, contain 61 chemical elements using optical emission spectrometry with inductively coupled plasma. Based on the research results, an analysis of macro-, micro- and toxic elements was carried out.

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Castor bean is a perennial plant belonging to the milkweed family that is primarily grown for its oil production. Homeland - Northeast Africa. The castor bean stem is herbaceous, hollow, and grows straight. The multi-colored leaves are large, shield-shaped, long-striped (25-60 cm), divided into parts. The flower is small, green, the inflorescence is small, pea-shaped, consists of 5 petals.

1500 BC, castor seed oil was used as a medicine. Glycerin and ricinoleic acid are formed from castor oil under the action of the enzyme lipase. Ricinolic acid acts against the absorption of water and electrolytes in the intestine, and glycerin is absorbed into the intestinal mucosa and facilitates its movement, so it is used for acute constipation, when intestinal motility increases. It is prohibited to use castor oil in case of poisoning with fat-soluble substances.

Flax is a family of annual and perennial plants belonging to the flax family, a crop grown for its fiber and oil. Distributed in temperate and subtropical regions. Flax is an annual plant grown for its fiber. The stem is thin, smooth, grows erect, light green, 60-120 cm tall. An adult plant has a yellow-green stem. The leaf is simple, unoccupied, arranged alternately, green in color. The flower cluster is located at the end of the stem, blue in color, self-pollinating.

Flax seeds are a valuable dietary natural product, the richest natural complex of biologically active substances - polysaccharides, healthy unsaturated fatty acids Omega-3, Omega-6 and Omega-9. White flax seeds differ from brown flax in their high content of lignans and polyphenols, as well as their mild taste. Lignans (phytoestrogens) are plant analogs of female sex hormones that help maintain normal hormonal balance and improve the appearance of skin, hair and nails. The product has a unique composition and contains many useful substances necessary for the normal development of the body: magnesium; phosphorus; potassium; calcium; sodium. Contains the following trace elements: copper; manganese; selenium; zinc; iron Flax seeds contain various vitamins, including: Group vitamins: B1, B4, B2, B5, B3, B6, B9. In addition, the product contains: Vitamins E, C, A.

Flaxseed is used for the treatment and prevention of many diseases. The product has a beneficial effect on many systems of the human body, namely: it has a wrapping effect on the mucous membrane of the gastrointestinal tract; protective and soothing effect on stomach and duodenal ulcers, inflammation of the esophagus, colitis and enteritis; has a mild laxative effect; has a sclerotic effect and reduces cholesterol levels in the blood; improves vascular function; has an anti-inflammatory effect; helps fight excess weight; improves vision; protects the respiratory system; stimulates fertility; strengthens the immune system; reduces high blood pressure; reduces the risk of heart attack; normalizes liver function; helps overcome many female pathologies; helps with colds and burns; cleanses the body of toxins; works as a cancer prevention agent. Flax seeds are used not only as a medicine, but also as a cosmetic product.

Experimental part:

Determination of the amount of chemical elements in a 1:1 ratio in samples of castor bean and flax plants using inductively coupled plasma optical emission spectrometry.

Results. The results of the analysis are presented in the table below.

Table 1.

Results of determination of chemical elements in a sample using the ICP-OES method.

Analite	Amount per 100 g sample, mkg	Analite	Amount per 100 g sample, mkg
Al	367 881,60	Nb)	59,49
P	68 062,43	Be	1,26
As	36,11	Er	11,74
Sn	1 079,68	Cu)	1 510,10
Tl	21,71	In	147,37
Se	1,26	Ag	11,75
Mo	127,83	Yb	5,67
Sb)	71,20	La	12,30
Zn)	5 629,49	Ti	208,57
Rb	1 499,18	Gd	26,78
Pb)	49,04	Hf	12,24
Ni	278,97	Tm	12,06
Bi	25,19	Zr)	3,34
Re	1 494,96	Ho	22,49
Cd	28,95	Tb	69,11
Te)	193,39	Sc	2,10
Co	430,93	Sm	540,75
W	13,25	Y	15,79
B	395,78	Nd	24,24
Si)	16 763,96	Eu	9,32
Mn	2 136,24	Pr	173,48
Fe	14 638,44	Ca	152 795,71
Lu	9,39	Dy	21,48
U	700,29	Sr	1 930,73
Ge	13,72	Ce	57,07
Ta)	44,66	Ba	219,25

Mg	317 790,41	Na	45 358,90
Th	73,96	Li	232,61
Cr)	589,81	K	897 327,46
Ga	32,92	Cs	4 352,35
V	284,67		

The table shows that macroelements were found in large quantities in the studied plant samples. Their amounts are as follows: Phosphorus (P 12,658,062 mcg, Potassium (K) 897,327.46 mcg, Calcium (Ca) 152,795.71 mcg, Sodium (Na) present 45,358.90 mcg, Magnesium (Mg) 317,790 .41 mcg.

Table 2

Amount of toxic elements in the sample (mcg)

Name of element	Amount per 100 g sample, mcg
Arsenic As	36,11
Lead Pb	49,04
Antimony Sb	71,20
Uranium U	700,29

The table shows that toxic elements were found in small quantities in all plant samples studied.

Conclusion. When studying the antioxidant capacity of flax and castor bean plants in the ratios 1:1, 1:2, 1:3, the 1:1 ratio showed the greatest antioxidant capacity. Therefore, a new food additive was prepared in a ratio of exactly 1:1 and the elemental composition of this prepared food additive was studied by inductively coupled plasma optical emission spectrometry. The presence of 61 elements was detected. Among the macroelements in the sample, there are relatively many elements of sodium, magnesium, silicon, phosphorus, potassium and calcium. It has been established that iron, aluminum, manganese and zinc contain more trace elements compared to other elements. According to the results of the analysis, due to the relatively large number of macro- and microelements in plants, the medicinal properties are high. Based on these results, new dietary supplements have been proposed that can be used in the treatment of skin rashes and constipation using dietary supplements based on flax and castor beans.

References

1. Асқаров И.Р. “Сирли табобат” -Т.: Фан ва технологиялар нашриёт-матбаа уйи. 2021. Б. 1084.
2. Асқаров И.Р. Табобат қомуси. Т.: «Мумтоз сўз».-2019. -Б.-2019.
3. Xalikov B.M., Ergashev B.D., & Po'latov S.M. (2023). KANAKUNJUT VA UNING FOYDALI XUSUSIYATLARI. "yosh mutaxassislar" ilmiy-amaliy jurnali., 2023-05(1), 228–233. https://doi.org/10.5281/zenodo.7978998
4. Azizova S. S. Farmakologiya. Toshkent: Yangl asr avlodi. - 2006-yil. - 5,301-betlar
5. Xolmatov X.X., Axmedov A. Farmakognoziya. Toshkent, Ibn Sino nomidagi nashriyot-matbaa birlashmasi. 1995, 8-12 betlar.
6. Atabayeva H., Qodirxo‘jayev O. O‘simlikshunoslik. Oliy va o‘rta maxsus ta’lim vazirligi tomonidan bakalavriyat ta’lim yo‘nalishi uchun darslik sifatida tavsiya etilgan. Toshkent «Yangi asr avlodi» 2006.
7. Agroolam.uz. Bir va ikki yillik gul ko‘chatlari yetishtirish qo‘llanmasi. Toshkent, 2020.
8. Hidoyat.uz. Shamsiddinxon Boboxonov nashriyot – matbaa uyi. Toshkent, 2019.
9. Sog‘likni saqlash vazirligining 2018-yil 27-martdagi “Dori vositalarini va tibbiy buyumlarni tayyorlash, saqlash, ularning sifatini nazorat qilish hamda ularni rasmiylashtirish tartibi to‘g‘risida”gi nizomi. Toshkent.