4. X-ray examination of seeds of various crops and products of their processing [Electronic resource]. – Access mode: http://www.dslib.net/agro-fizika/rentgenograficheskoe-issledovanie-semjan-razlichnyh-selskohozjajstvennyh-kultur-i.html. – Date of access: 10.26.2019.
5. Agricultural materials [Electronic resource]. – Access mode: http://agro-archive.ru/metody-issledovaniya/158-metody-analiza-semyan.html. – Date of access: 09.03.2019.

THE CONTENT OF THE ANTHRACENE COMPOUNDS IN THE LEAVES OF THE DANDELION, COLLECTED ON THE TERRITORY OF VITEBSK REGION

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In 2017, the Republic of Belarus developed and adopted the Strategy "Science and technology: 2018-2040". One of the most important directions of this Strategy in the field of Bioindustry is the development of technologies for obtaining economically valuable products based on plant raw materials, as well as the development of therapeutic and preventive drugs, functional products, children's and herodietic nutrition. To implement these directions, the chemical composition of wild plants, one of which is dandelion officinale (Taraxacum officinale), is studied [1]. The Pharmacopoeia of many countries, including the State Pharmacopoeia of the Republic of Belarus, contains information about the roots of dandelion. When harvesting dandelion roots, its aboveground part is discarded. In foreign medical practice, along with the underground, the above-ground part of this plant has also found wide application. In some countries, it is used for the manufacture of anti-inflammatory drugs and immunomodulators. There is evidence of the use of the aerial part of the dandelion in folk medicine in European countries [2, 3].

The aim is determination of the quantitative content of anthracene derivatives in dandelion leaves collected in the Glubokoye, Braslav and Vitebsk regions.

Material and methods. The material of the study was the leaves of dandelion collected during flowering in the spring of 2019 on the territory of Vitebsk, Glubokoye and Braslav districts of the Vitebsk region of the Republic of Belarus. 0.2 g of crushed dandelion leaves were placed in a flask with a capacity of 50 cm^3, dissolved in 10 cm^3 alcohol when heated in a water bath at 30-400°C. Cooled, filtered into a volumetric flask at 25 cm^3, brought the volume of the solution with alcohol to the mark, mixed. The optical density of the resulting solution was measured on a spectrophotometer at a wavelength of 590 nm, using acetone as the comparison solution.

The content of anthraquinone derivatives in terms of hypericin in percent (X) was calculated by the formula:

$$x = \frac{D \times 25 \times b \times 100}{m \times 513}$$

where D – optical density of test solution at a wavelength of 590 nm; 513 – specific absorbance of hypericin in acetone at a wavelength of 590 nm; m is the mass of the drug sample, in grams; b is the average sample mass [4].

Findings and their discussion. According to the literature, anthracene compounds stimulate the synthesis of plant polysaccharides, participate in redox processes, protect plants from adverse effects of microorganisms. The obtained values are presented in the table:

Table – Quantitative content of anthracene compounds derivatives in plants from dandelion leaves collected in different districts of Vitebsk region, M ±m

Region	Content of anthracene compounds, %
Vitebsk	0,26±0,02
Glubokoe	0,19±0,01*
Braslav	0,09±0,01*

Note: * - $p \leq 0.05$ compared to Vitebsk region.

It follows from the table that the content of anthracene derivatives in the raw materials collected in the Glubokoye district is significantly lower than in the raw materials collected in the Vitebsk region, by 1.36 times. The content of anthracene derivatives in the raw materials collected in Braslav district is significantly lower than in the raw materials collected in Vitebsk region, by 2.88 times. Differences in the content of anthracene derivatives may be associated with the peculiarities of the climatic regime and soils in different regions of the Vitebsk region.

Conclusions. The main effect of derivatives Andrianovich connections laxative. Anthracene derivatives show their action only in the large intestine, where they are hydrolyzed by the intestinal flora. Formed aglycones irritate the walls of the rectum and enhance its peristalsis. Laxative effect develops slowly and for a long time (for 8-10 hours). As a laxatives derivatives of anthracene are used in the elderly, slows down when the mobility of the intestine.

Thus, dandelion leaves can be included in the composition of infusions used in the treatment of diseases of the gastrointestinal tract.

1. Shenderova, E.S. Content and accumulation of flavonoids in dandelion leaves / E.S. Shenderova // Youth and medical science: materials of VI Interuniversity scientific research.- prakt. Conf. Young scientists from international. participation – Tver: Ed.-ed. The Center Of Tver. state honey. Univ., 2018. – Pp. 443-446.
2. Tiguntseva, N.P. Chemical composition of extractives dandelion / N.P.Tiguntseva, S. N. Evstafiev // New achievements in chemistry and chemical engineering plant materials: materials. Vseros. science. Conf. international. participation. – Barnaul: Publishing house Alt. UN-TA, 2012. – Pp. 303–304.

3. Tiguntseva, N.P. Biologically active substances dandelion Taraxacum Officinale / N. P. Tiguntseva, R. A. Vorob'eva, S. N. Evstafiev // prospects of development of processing technology of hydrocarbon, vegetable and mineral resources: proceedings of the proc. science.- practice Conf. international. participation. - Irkutsk, 2013. – Pp. 183–185.
4. Ermakov, A.I.Methods of biochemical research of plants / A.I. Ermakov. – M., 1987. – 430 p.

THE DEVELOPMENT OF THE INTERNET OF THINGS IN THE CONTEXT OF ECOLOGICAL PROBLEMS

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The Internet of things plays a significant role in the modern world. Its implementation is ubiquitous: in agriculture, smart devices are able to predict possible yields; in industry, they are used due to the need to regulate the work of production, to control breakdowns and the operation of automated equipment.

The relevance of this topic is conditioned by the active development of the Internet of things market, as well as the acute environmental situation at the global level. According to statistics, the volume of the Internet of things market in the Russian Federation for 2018 amounted to 250 billion rubles, investments are also increasing in volume. The growth of investments in this area is forecasted [1].

The aim of the work is to study the market of the Internet of things in the field of solving environmental problems: rational consumption of resources, proper cultivation of land in agriculture, etc.

Material and methods. One of the hallmarks of the IoT market is its multi-profile development. One of the main directions of the development of the Internet of things market is the solution of environmental problems.

Findings and their discussion. Among the main environmental problems can be identified:

• Pollution of air, water, land pools
• Reducing the resource volume of the planet (minerals, flora, fauna)
• Deterioration of soil resources because of an inappropriate farming

The Internet of Things offers the following solutions:

1. The use of environmental sensors.

This type of sensor is able to provide quick access to all modifications in the environment; allows careful monitoring, with the help of which it is possible to build forecasts and calculations in the future. Such sensors can be used to measure temperature, humidity, the level of trace elements in water, soils, and the level of radiation.

2. The use of technology in agriculture.