

Study of influence of adventitious sorts of drug plants on agrophytocenosis

Purpose. Support for agroecosystem stability, safe biodiversity enrichment. **Methods.** Classic, comparative, morphological, ecological and geographical. **Results** The species that are used in the new territory are often very aggressive and displace the plants characteristic of this area. Such adventitious species include *Polygonum cuspidatum* and *Polygonum sachalinensis*. In order to find alternative sources of flavonoids, we have been involved with the species of the genus *Polygonum*, which can be a raw material for biologically active drugs. **Conclusions** The use for the production of adventitious and invasively dangerous species is simultaneously controlled by their number in places of significant distribution of the latter.

Key words: adventitious species-introductions, introduction, naturalization, flavonoids.

The introduction of plants is one of the methods of studying and preserving plants outside their natural growth sites, a way to falsify various material needs of a person, and expand the cultigenous habitats of plants. Many years of observation of introduced plants make it possible to establish their adaptation possibilities, polymorphism, phenotypic variability, compare similar species, to study the nature of ontogenesis and regularity of the seasonal growth and development rhythm. The analysis confirms that often the origin of organisms affects their ecological characteristics and adaptation to a certain location growth. However, numerous organisms in agro-landscapes did not always exist in a certain area, but were carried by a person deliberately or accidentally. The variety of adaptation strategies of adventitious plant species to local conditions requires taking into account the specifics of their development, the spread in new conditions for the creation of methods for the protection of agro-landscapes and the development of a National Strategy of Ukraine on the problem of non-abiotic species. The success of the implementation of the resources provided by the strategy depends on scientifically grounded organizational, financial and legislative support from the state. The purpose of the research is to develop the theoretical principles and mechanisms for maintaining the agroecosystem stability, safe enrichment of biodiversity. **Materials and methods of research.** The classic, comparative, morphological, ecological and geographic methods of research were used to conduct routing-floristic surveys and records of inbound siblings with field documentation of material and collecting herbarium specimens. Our methods are used to evaluate the condition and placement of medicinal plants that have been naturalized during the introduction. Adventitious plant species are plants that are acclimatized and occupy a certain place in the plant cover of the territory, which were brought by people or entered animals. The species that are used in the new territory are often very aggressive and displacing the habitat of this plant. Such adventitious species include *Polygonum cuspidatum* and *Polygonum sachalinensis* [8]. After entering the new places of growth, adventitious plants are settled in different ecotope conditions. Their distribution in the new locality is mostly influenced by human activities and natural factors. As a rule, adventitious plants do not occur in natural ecotops, and if they are found there, then only in places with broken grass cover: in hills, open sandy places, banks of rivers, roads, parking lots, etc. (say, Archipelago Canadian, Venoter Biennial, etc.). The main species diversity of plants-introductions is concentrated in places that are constantly exposed by man, and the more intense it is, the greater the number of adventitious species [11]. In many places, they are dominant weed groups, distributed predominantly where the vegetation is damaged. Saccharin, Sakhalin buckwheat (*Fallopia sachalinensis*, *Reynoutria sachalinensis*, *Polygonum sachalinensis*) is a herbaceous Roslyn of the genus *Grichak* family (Fig. 1). Straight, thick stems of plants have thickened internodes, upper branches, bare. Stems up to 4 m in height, gaining green or brown color and growing annually from wintering rhizomes. The

rhizome is cord-like, creeping. Leaves - broad-leaved or elongated-egg-shaped with a heart-shaped rounded base, short-necked, bare, long, and long, 20 cm wide, have a slightly wavy edge. Flowers are small, whitish. Inflorescences - axillary vagina, collected in short beams. Fruit - triangular nut [5]. This perennial plant grows rapidly, forming for a season a significant vegetative mass. In one place can grow 6-10 years or more, unpretentious to soil-climatic conditions and lighting. Provides ferret for fertile, well-moistened soils with a weak acid reaction [9]. Sakhalin Mining - a Far Eastern species that cultivates as a decorative plant. It is used to decorate buildings, create decorative thickets and green fences. However, this species often mushrooms and spreads in large areas, especially in floodplains of rivers [3]. Under natural conditions, the plant grows in southern Sakhalin and the Kuril Islands (Russian Federation), in Japan. In the homeland, it forms continuous thickets in river valleys, lowlands, mountain slopes and wet meadows. In Ukraine, the plant was relatively recent - about 100 years ago - and was planted by prominent scientists VG Besser in the Kremenets Botanical Garden [4]. According to the literary data, 15.3-18.4% of proteins were detected in the above-ground part of the Sakhalin Gorkha, 0.3-1.1% was routine, 564.9-872.9 mg /% ascorbic acid, 26.0 - 28,8% - cellulose, 0,008-0,012 - carotene, 0,3-0,5 - mineral salts of phosphorus, 0,7-1,5% - calcium. The content of tannins in the leaves does not exceed 10.5%, in the cases before flowering - 28.2% [3].

The plant has antibacterial activity. Gives a large green mass, so young shoots feed on cattle and horses. The extract from leaves can be used In Japan, this property of plants is widely used for the recultivation of land contaminated with industrial and domestic waste. The significant biomass of the plant quickly rotates, resulting in improved structure and increased soil fertility. Squirrels of stems are used as fuel [1]. Japanese Mustard (*Polygonum cuspidatum*) is a perennial herb of the genus *Herczak* of the *Hrechkov* family (Fig. 2). Plant height 1.5-2 m, sometimes - up to 3 m. Empty branched stems with thick knots, which grow annually from branchy rhizomes, reminiscent of bamboo. The leaves are dense, large, bright green, egg-shaped, 13 cm long, up to 10 cm wide with sharply sharpened tops [6]. Flowers are white, collected in the axillary kite-like inflorescences. Under conditions of Ukraine, fruit is not achieved. The plant grows predominantly in shaded, similar areas, with exceptional resistance to frost. Propagates mostly vegetatively - cranking (segments of a stem with one or two nodes) or parts of rhizomes. For small gardens it is not recommended to use this species because of its aggressiveness. New plants grow from the smallest parts of the rhizomes and grow rapidly, displacing other species. Young shoots are able to penetrate through the concrete coating. Studies have shown that only dense polyethylene barriers and treatment with a herbicide-glyphosate during flowering may restrain this plant for some time. Homeland of the bitter Japanese - medium and southern Japan. In Ukraine it occurs in the territory of parks, gardens, within the settlements, near the reservoirs. Our country was entrusted with Europe in the XIX century. Like a decorative look. Nowadays it is widespread as terrible not only in Europe, but also in North America, in particular the state of Washington, where it is listed as an outrageous weed. However, it is often used with a decorative purpose, to fasten slopes as a forage plant. Rhizobuses of Japanese mushroom in the national medicine of Southeast Asia are used for the prevention of diseases of thrombosis. Young leaves fed as a green fodder and fermented. For the traditional Japanese cuisine, young shoots are vegetable. In Chinese medicine, Japanese marmalade is used as a laxative and as a gelrel plant dye [7]. Research results. These adventitious species are very common in Ukraine. They supplant other plants from their natural habitats. During the study of ecological-coenotic peculiarities of introducts naturalized in natural and artificial cenotes, it has been established that most of the species of the genus, *Polygonum cuspidatum* and *Polygonum sachalinensis*, are naturally naturalized in ruderal ecotopes. The number of naturalized specimens in these conditions was 54%. The least of them was detected in segetal ecotops - only 8%. Very often introducts were naturalized in geminatural ecotops, where there were 22% of them. The share of introducts in residential ecotops accounted for 16%. *Polygonum cuspidatum* and *Polygonum sachalinensis* are practically not used in Ukraine's national economy, although they can be an important basis for the pharmaceutical industry.

Fig. 1. Sakhalin Mountain - *Polygonum sachalinensis* for skin rejuvenation. The population of Sakhalin is packed with fresh and boiled leaves, prepared from salads and soups. Studies by Japanese scientists have proved that Saha-Linsky grizzly is able to remove heavy metals from the soil and convert them into non-toxic neutral compounds.

Fig. 2. Japanese Mustard - *Polygonum cuspidatum*

According to literary sources, *Polygonum cuspidatum* and *Polygonum sachalinensis* contain such biologically active substances as flavonoids, derivatives of anthracene and anthracenones [3]. Pharmacological action of flavonoids is to regulate the state of capillaries, detect diuretic (diuretic), antispasmodic and choleric effects on the body, lower blood pressure, tonic cardiac muscle, dilation of coronary vessels, decrease in blood coagulation. Flavonoids - water-soluble compounds, which depend on the coloration of flowers and fruits. Some flavones weaken the action of toxic substances, have antimicrobial and anti-histamical properties (hawthorn fruit of the sting, berries of buckwheat croutons, common heather grass, hop cones, tea leaves, etc.). Flavanols in combination with ascorbic acid exhibit anti-inflammatory and anti-allergic effects on the capillary system. Flavone compounds are used for the treatment of allergy (bronchial asthma, anaphylactic shock), myocardial infarction, diabetes mellitus. Flavonoids have a wide range of biological activity: they participate in the oxidation processes, performing the antioxidant function; Absorb ultraviolet light; Prevent the destruction of chlorophyll. The most important sources of flavonoids include flowers of arnica, elderberry black, raspberry, linden, birch leaves, Baikal noodles and malted licorice, fruits of horse chestnut, herb horsetail [2, 10]. In order to find alternative sources of flavonoids, we have been involved with *Polygonum cuspidatum* and *Polygonum sachalinensis*, which can be a source of biologically active drugs. Since each plant has a unique flavonoid complex with its own individual characteristics, actively propagating plants with a high vegetative mass but not used sufficiently, can be an important source of raw materials for the pharmaceutical industry. The content of flavonoids in the leaves of the studied species was determined by UV spectrophotometry. In this case, the presence of flavonoids of the flavanol group in *Polygonum cuspidatum* and *Polygonum sachalinensis* has been established. The number of flavonoids per rutin in the leaves of *Polygonum cuspidatum* and *Polygonum sachalinensis* was determined by the method of spectral photometry of the aluminum chloride complex, and it was 3.95 and 5.65%, respectively. The anthraquinone of emodins and other anthracenobacteria were detected by thin layer chromatography in *Polygonum cuspidatum* leaves. The presence of valuable natural compounds in the over-Earth mass *Polygonum cuspidatum* and *Polygonum sachalinensis* and the unrestricted raw material base of the latter indicate the promising development of biologically active drugs on their basis. Penetration of the adventitious species can lead to a decrease in the yield of agricultural crops, onions and pastures; Contamination of the crop and deterioration of its quality; The transfer of pathogens and the accumulation of pests of agricultural crops, and may also adversely affect people's health, violate the composition and structure of local phytocoenoses. Adventitious weeds are very difficult to destroy, because they have high viability and fertility, effective means of distribution, noncompliant to the conditions of existence. These species are not well-known to the population, their biology is also not well understood, which to a certain extent constrains the struggle with them. The presence of useful properties in aggressively adventitious plants, which include the species *Polygonum L.*, will help to solve the problem of control over their distribution in the territory of Ukraine.

Conclusions

Adventitious species are widely distributed on the territory of Ukraine and displacing other plants from their natural habitats. According to the chemical composition, *Polygonum cuspidatum* and *Polygonum sachalinensis* contain flavonoids and derivatives of anthracene, which have a high phytotherapeutic action. *Polygonum cuspidatum* and *Polygonum sachalinensis* are a potential source of drug preparations. For the use for the production of adventitious and invasive hazardous species at the same time, control over their number in areas of significant distribution of the latter.

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