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Тимофеев Н.П., Ковальски П.В., Крывуч Ж. Адаптация *Rhaponticum carthamoides* к эдафическим факторам (обеспеченности теплом, длине дня и вегетационного периода), исходя из продуктивности и способности к синтезу эктистерона / Возобновляемые лесные и растительные ресурсы: Химия, технология, фармакология, медицина. СПб, Государственная Лесотехническая Академия (СПбГЛТА), 2011. – С. 230-231.

ADAPTATION OF RHAPONTICUM CARTHAMOIDES TO EDAPHIC FACTORS (HEAT, LENGTH OF DAY AND GROWING SEASON), BASED ON PRODUCTIVITY AND ABILITY TO SYNTHESIZE ECDYSTERONE

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1. Object and methods of researches. Proceeding from necessity of an establishment of influence of natural and climatic factors on ability to live of medicinal plants *Rhaponticum carthamoides* (*Leuzea, maral root*), species comparative study in 6 agropopulations cultivated in Poland and Russia was made. The medicinal raw materials are designed for reception ecdysterone containing pharmpreparations, drugs and fodder additives.

2. Within 5 years indexes of development of 2 populations in Central Poland (Bygdoshch, agrofirma "Fitostar") compared to parametres of 4 agropopulations grown in the European North (Russia, the Arkhangelsk region). Investigated the soil factors influencing density of species, formation of propagules and phytomass accumulation on years of life in an ontogenesis; studied ability to biosynthesis ecdysterone during vegetation (HPLC-method).

3. For both climatic zones relatives are a soil type (sod-podzolic), level of its fertility, the content of nutrients and moisture parametres. Differences was concluded in smaller duration of a frostless season, and provision of heat during a season of vegetation and length of light day. In the European North the sum of temperatures above +5 ... 10 °C less on 30-40 %, and above 15 °C – on 50-60 %.

The growing season is shorter for 2 months (175 against 235 days), a frostless season – on 50 % (105 days against 150). The length of light day, on the contrary, is more (16-20 hours against 14-16).

4. Results. It is assigned, that processes of growth and development of propagules *R. carthamoides* in two different climatic regions are identical – a median number of propagules, their height, width of blades are identical to the same age states of an ontogenesis. Development to a blooming phase occupies in Poland 56-61 day, fructification of 71-77 days. Heat disadvantage in the European North is compensated by larger duration of light day - blooming comes through 44-51, fructification through 66-72 (77) days. The average density of sowings (number of plants per acre) within 4th years of life also is identical. In the conditions of Poland it is close to value in the European North: for 3rd year of life 31 against 23-32 thousand plants of/hectares, for 4th year - 21 against 19-25 thousand plants.

Productivity of agropopulations, irrespective of geographical region and characteristics of soils, has compounded for 3rd year of life about 500 kg/hectares. For 4th year of life, during a blooming phase in June, efficiency was enlarged to 700-800 kg/hectare, and in July (in a fruiting stage) has reached about 1000 kg/hectare. In further, after the introduction into the generative season, for 5-6th year of life in the conditions of the European North there is a doubling-trebling of magnitude of phytomass - to 2000-3000 kg/hectare, for 6-7th years – to 5000-8500 kg/hectare for above-ground parts and 3400-6500 kg/hectare for underground parts.

In an ontogenesis the contents ecdysterone in adult leaves has compounded accordingly: 0.04 and 0.06 % at juvenile plants for 1st year; 0.18 % and 0.17-0.22 % at virginitive plants for 3rd year. For 5th year at generative plants during a phase of a regrowth the contents ecdysterone in both climatic zones also was to relatives of 0.52 % and 0.53 %. The content ecdysteroids in leaves of plants depended on a development phase. The maximum concentrations ecdysterone (0,4-0,5 %) in all populations were observed in the early spring after a regrowth. During a phase blossom fading the content ecdysterone decreased in 1,5 times. After blooming of plants has dropped in 2 times, and after fructification the difference in concentration ecdysterone at young and old leaves has compounded 6 times.

Conclusions. Thus formation productivity and biosynthesis ecdysterone heating support of area of cultivation has no crucial importance. In the conditions of a cold climate of the European North development *R. carthamoides* in an ontogenesis to similarly that in the conditions of a warm climate of the central Poland, but with alteration for 1 month later.

FINE STRUCTURE OF PAPERMAKING FIBRES AND ITS PRACTICAL ASPECTS

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The development of the research equipment and methods, and the further improvement of the technologies are boosting the studies on the micro- and nanostructure of papermaking fibres and cellulose particles. This paper focuses on the localization of the residual components in the chemical pulp fibre walls and the properties of nano/micro particles from wood and cellulose. The beating and grinding processes are binding these two topics together.

The localization of residual wood components in pulp fibres was investigated mainly by using hydromechanical peeling of the fibres' surface layers by the prolonged mixing of the fibres' water-ethanol suspension in a laboratory disintegrator. This method has been continuously extended and modernized at the Latvian State Institute of Wood Chemistry, Riga, during several years. The advantage of the method is the possibility to separate and isolate the surface layers in quantities which are sufficient for certain analytical procedures. In spite of the developed network of micro- and submicropores, the final localization of residual wood cell components (lignin, hemicelluloses) is uneven across the fibre wall. The content of lignin and heteroaromatic compounds (furanoids/furan polymers) as well as oxypolysaccharides is determined to be higher in the surface

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