

**The main conference:
“Renewable Wood and Plant Resources:
Chemistry, Technology, Pharmacology,
Medicine”**

**Satellite conferences:
Youth school-conference:
“Physical-Chemical Analysis of Organic
Compounds of Plant Origin”**

**Thematic Symposium
of Nonprofit Partnership
“OrCheMed” (Organic Chemistry and Medicine)
“Novel Drugs Based on Plant Substances”**

Sponsoring Organizations

Biochemical Holding "Orgkhim" - General Partner of the Conference



Grenoble Institute of Technology (PAGORA), France



Russian Forest-Based Sector Technological Platform

Russian Foundation for Basic Research



Company "Analit" – the general distributor of "Shimadzu"



Company "Bruker"



CONTENTS

Renewable Wood and Plant Resources: Chemistry, Technology, Pharmacology, Medicine.....	5
Physical-Chemical Analysis of Organic Compounds of Plant Origin.....	263
Novel Drugs Based on Plant Substances	277
Russian-Austrian Seminar on Cellulose Chemistry.....	298
INDEX.....	308

Timofeev N.P. Researches on Managed Biological Synthesis Ecdysteroids and Biotechnological Process of Manufacture of Medicinal Raw Materials from *Leuzea carthamoides* and *Serratula coronata* / Renewable Wood and Plant Resources: Chemistry, Technology, Pharmacology, Medicine. International Conference RR 2011. Saint-Petersburg, State Forest Technical Academy, 2011. P. 229-230.

Тимофеев Н.П. Исследования по управляемому биосинтезу экдистероидов и биотехнологическому процессу производства лекарственного сырья из левзеи сафлоровидной и серпухи венценосной / Возобновляемые лесные и растительные ресурсы: Химия, технология, фармакология, медицина. Мат-лы междунар. конференции. СПб, Государственная Лесотехническая Академия (СПбГЛТА), 2011. – С. 229-230.

RESEARCHES ON MANAGED BIOLOGICAL SYNTHESIS ECDYSTEROIDS AND BIOTECHNOLOGICAL PROCESS OF MANUFACTURE OF MEDICINAL RAW MATERIALS FROM LEUZEA CARTHAMOIDES AND SERRATULA CORONATA

N.P. Timofeev

CF BIO (Research-Production Enterprises), Koryazhma, Russia
timfbio@atnet.ru

The medicinal raw materials of plants *Rhaponticum carthamoides* and *Serratula coronata*, containing phytoecdysteroids, were used in medicine for the decision of a wide range of problems for conservation of health of the person, including for treatment and preventive maintenance of cardiovascular and oncological diseases, increase of acclimatization of an organism to action of unfavorable and harmful factors of inhabitancy.

Proceeding from necessity of revealing of factors, growth-regulating, development and the maximum efficiency ecdysteroids synthesising (Es) plants with the enriched content of target materials and high biological activity in medicinal raw materials, the wide complex of scientific researches in following directions is actual:

1. Studying of laws of ability to live of Es-plants in ontogenesis, features of formation by them endomyccorrhiza; topology, growth and development of symbiotic structures in annual cycle, them is also a microanatomic structure.
2. Dynamic communications between development endomyccorrhiza in an annual cycle and growth of above-ground members of Es-plants during vegetation were investigated.

3. Response of Es-plants (chemical composition, number, growth and development of propagules, parameters of efficiency and phytomass) on soil nutrition intensification was revealed.
4. Influence agrochemical and cultivation technology factors (entering different types of organic and mineral fertilizers, an intensification of alienation of biomass, humidity into a root layer of populations) on magnitude of biosynthesis and qualitative compound phytoecdysteroids were positioned.

Works were made during 2008-2009 years for scientific Grants RFFI № 08-04-98840. By results of researches it was positioned that life activity Es-plants (*R. carthamoides*, *R. scariosum*, *Serratula coronata*) in an ontogenesis it was intimately connected to symbiotic relations with fungus from genus *Glomus* (Glomeraceae: Glomeromycota). Age stages of development of a mycorrhiza in an annual cycle, variability of parameters of vegetative frames, and also the key moments allowing a plant to supervise fungus and natural factors, managing were in detail considered by a plant.

The hypothesis was put forward, that through the mechanisms underlying ecological-biochemical interactions VAM-mycorrhiza and Es-plants, it is possible to manage efficiency, biosynthesis and accumulation phytoecdysteroids in members of plants - controlling biological, technological or agrochemical methods efficacy of microbiological-vegetative plants mutual relations.

Strong negative reaction *R. carthamoides* was experimentally proved on entering of centre and high doses of organic fertilizers as readily available power supplies. Ability of plants to a reproduction drops in 2-4 times, efficiency - to 1.7 times, biosynthesis phytoecdysteroids - from 3-5 to 10 times. At use of small doses of mineral fertilizers level decrease phytoecdysteroids in medicinal raw materials was insignificant (on 7-12 %).

Qualitative compound phytoecdysteroids and containing them low activity ecdysteroids it was bound to formation of reproductive propagules and their development during vegetation. It was revealed that qualitative structure phytoecdysteroids and enrichment their individual substances was connected with formation of reproductive propagules and intensity of their development during vegetation. Therefore at plants of the generative season the balance of compound phytoecdysteroids can be changed through influence ecological or anthropogenic factors.

Acknowledgments. The work was done on a partial financial support granted by the Russian Fond for Fundamental Investigations (RFFI) and the administration of the Archangelsk region.

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

N.P. Timofeev¹, P.W. Kowalski², J. Krywuc²

1 - CF BIO (Research-Production Enterprises), Koryazhma, Russia

2 - FITOSTAR, Gdynia, Polska

timfbio@atnet.ru

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 parameters 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 parameters. 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 %.

Sofronov A.V.	13
Sokolova A.M.	236
Sokolova E.V.	211
Sokolova L.S.	295
Sokolova M.P.	273
Soleyman R.	169
Solntsev A.P.	218
Solovskiy M.V.	48
Song T.	170
Sorokina K.N.	110
Sosnov D.A.	153
Sousa G.D.A.	46
Sozinov O.V.	268
Spinu O.	170
Spirina T.N.	212
Spitsyn A.A.	101
Spivak A.Yu.	82, 189
Stankevich V.K.	285
Starkova E.V.	133
Stashenko E.	180, 212
Stashenko E.E.	17, 49, 132, 133, 180, 184, 213
Stavarache C.	147
Stefanovic B.	302
Stepanov N.	214, 215
Stepanova E.V.	274
Stepen R.A.	163
Stiebra L.	260
Stirna U.	86, 216, 250
Stoyko O.V.	77
Strand A.	217, 223
Strashnova S.B.	64
Strelyaeva A.V.	112, 114
Strizhakov D.A.	218
Su P.	218
Sudakova I.G.	219
Sudarikov D.V.	76
Sukhanova T.E.	273
Sukhov D.A.	302, 303
Sukhov D.A.	46, 220
Suleimen Ye.M.	221
Sumersky I.V.	63, 212, 222
Sundberg A.	217
Sundberg A.C.	223
Sushkova S.N.	31, 32, 269, 286
Suvanova F.U.	9
Syropyatov B.Ya.	294

T

Taherzadeh M.J.	127
Tamm L.A.	98, 188
Tanygina E.D.	224, 233
Tarabanko V.E.	210, 224
Taran O.P.	42
Taraskevich M.R.	109
Tashmatov Z.O.	55
Tchemerkin I.V.	224
Teissedre P.-L.	92
Teleshev A.T.	225
Teng Tan H.	41
Tenho M.	78
Teong Lee K.	41
Terenina M.B.	245

Terenzhev D.S.	152
Testova L.	226
Tilyabaev K.Z.	227
Timbaliuc N.	170
Timofeev N.P.	228, 229, 230
Tojiev P.J.	142, 178
Tokarev P.N.	16
Toktasynov S.K.	19
Tolmacheva I.A.	59, 71
Tolstikova T.G.	137, 242
Torlopov M.A.	117
Tran Dinh T.	214
Treimanis A.	231
Tretyakov S.I.	100
Trifonov R.E.	232
Trishin Yu.G.	188
Trofimov B.A.	285
Tsaturyan A.S.	106
Tselikova G.A.	93
Tsoy E.A.	160
Tsygankova L.E.	233
Turobjonov S.M.	232
Tuyen N.D.	198
Tychinskaya L.Yu.	8, 20
Tyulkova Yu.A.	182

U

Udoratina E.V.	264
Ugraitskiy A.A.	109
Um B.H.	167
Urazaeva A.I.	90
Urozov M.Q.	142, 178
Uryadnikov A.A.	233
Uryash V.F.	65
Uryupin A.B.	39
Us A.S.	122
Ushakov V.M.	239
Ushanova V.M.	234

V

Vahasalo L.	217, 223
Valeev F.A.	183
Valenkov A.	195
Valieva O.I.	33
Van Heiningen A.	70, 235
Varfolomeev S.	214, 215
Vasilyev A.V.	146, 271
Vasilyev V.V.	236
Vedernikov D.N.	237
Vejdovszky P.	169
Veprikova E.V.	237
Vereschagin N.A.	103, 238
Veselova O.F.	118, 120
Vetrova E.V.	31, 32, 286
Vigranenko Yu.T.	239
Vikele L.	231
Villaverde J.J.	239
Vilsons D.	216, 250
Vipova N.L.	289
Vladykina D.S.	240, 241
Vlasova E.N.	43, 264, 296
Volchek B.Z.	264, 296