

## ACCUMULATION AND VARIABILITY OF THE CONTENT ECDYSTEROIDS IN MEDICINAL RAW MATERIALS *LEUZEA – RHAPONTICUM CARTHAMOIDES*

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**Keywords:** leuzea carthamoides, medicinal raw materials, fractions of phytomass, ecological conditions, content of ecdysteroids, 20-hydroxyecdysone.

**Introduction.** *Rhaponticum carthamoides* (Willd.) Iljin (synonym: *Leuzea carthamoides* DC.) – perennial, fast-growing species from family Asteraceae (Compositae). *R. carthamoides* and drugs on its basis are switched on in the State pharmacopoeia and the List of medications of many states. The species is alien from high-mountainous region an alpestrine girdle (1200-2700 m above sea-level); it is characterised by duration of life cycle, indiscriminateness to conditions of soil fertility. Specificity of the secondary metabolism is accompanied by biosynthesis phytoecdysteroids, being the basic carriers of biological activity.

Problem of the production technology of powder of herb from ecdysteroid containing plants is extreme unevenness of allocation of acting materials on various organs [Dinan et al., 2001; Phytoecdysteroids, 2003]. It is invoked by that producing of organic matter and accumulation of the secondary metabolites is rather difficult depended from growth processes [Shain, 2005]. A Quality control, called to provide preparation of medicinal raw materials with the enriched content biologically active agents, demands knowledge of biochemical characteristics of separate fractions and their elements in phytomass structure. On the assumption of from necessity of revealing of the natural regularities influencing quality of medicinal raw materials *R. carthamoides*, the natural regularities influencing accumulation and variability of the content in them of acting materials (ecdysteroids) was researched.

**Methods.** The district of researches is located in the southeast of the Arkhangelsk region of the Russian Federation, in the European-West-Siberian taiga-timber bioclimatic range (geographical coordinates - 61°20" northern latitude, 47 ° EL.). Features of a climate are: a short frost-free period, significant overcast and surplus moistening. Duration of a growing period compounds 165-186 days, including frost-free - on the average 105 days (77-139).

Dynamics phytoecdysterids was observed at adult generative plants of 6-10th year of life. Various fractions of leaves organs, proceeding from terms of an regrowth and development phases served as objects of observing. Samples of vegetative propagules were

culled during a budding stage from 20-25 plants (on 2 leaves from each plant). Concentration ecdysteroids in the exsiccatae was researched with a method of high-performance liquid chromatography ( $\lambda=242$  nm), with computer data processing according a method of the intrinsic standart.

**Results.** 1. The beginning of vegetation of plants starts in some days after slope of the snow cover (in the end of April-beginning of May) and proceeds before transferring of daily average temperature in the autumn through 0 °C (2nd decade of October). Appearance of new young growing leaves, their growing and necrosis is not timed for certain phases of development, they function during all vegetation period, changing each other in time. Formation of leaves germs occurring at different times from different propagules in adult organs leads up to simultaneous accumulation in above-ground sphere of fractions of the ratooning, young growing, adult, old and died off leaves.

2. Dynamics of the content ecdysteroids in separate elements and phytomass fractions is combined with process of formation of propagules at which there is a redistribution biologically active agents from old in favour of growing and developing organs. The maximum concentrations major ecdysteroid *20-hydroxyecdysone* (20E) as a part of vegetative propagules are found in the youngest on physiological age the fractions which are not carrying obvious functions of photosynthesis.

3. Absolute values of variability of concentration 20E during vegetation in young leaves organs compound 2 times - 0.55-0.28%. In adult leaves of vegetative propagules, in 10 days after the regrowth beginning, the content 20E is makes 0.38%. In 30 days of vegetation, during intensive growth of propagules, concentration 20E drops to 0.27 %, and in 60 days - to 0.17 %.

Fall to the minimum values (0.11-0.12 %) in July-August coincides with droughty environmental conditions, in the autumn season concentration increases again and in September compounds 0.14-0.15 %. As a whole content absolute values 20E in adult leaves during active vegetation variate in 3 times (0.38-0.12 %). In old leaves level fall 20E is practically rectilinear, also does not depend neither on a development phase, nor from calendar terms of development of plants - it drops consistently during a growing period in 7-8 times - from 0.15 % to 0.02 %.

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# SIPAM3 & CIMB1

3<sup>ème</sup> Symposium International sur les Plantes Médicinales et Aromatiques  
et 1<sup>er</sup> Congrès International sur les Molécules Bioactives Oujda - Maroc 29 - 30 mai 2008

Oujda le 18 mars 2008

## *Accepted participation certificate*

Dear Sir/Madame: **Nikolay Timofeev** sciens@leuzea.ru

Establishment: Research-Production Enterprises CF BIO Archangelsk region, city Koryazhma, ul. Lenina, 47A-55 ; Russia, 165650

Laboratory: Research-Production Enterprises CF BIO

Contributions entitled:

- 1. Comparative results 4-years cultivation rhaponticum carthamoides (leuzea, maral root) in conditions of poland and the european north of russia.**
- 2. Accumulation and variability of the contents ecdysteroids in medicinal raw material of leuzea (rhaponticum) carthamoides**
- 3. Ecologically-biochemical interactions between ecdysteroid producing plants and phytophagans [on example rhaponticum carthamoides and serratula coronata (asteraceae)]**

We are very pleased to inform you that the organising committee has accepted your work to be presented in the symposium as:

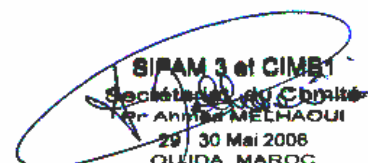
- **Poster contribution**

**IMPORTANT NOTE TO AUTHORS:** Acceptance without payment of the fees will not be taken in consideration.

In the hope to see you soon among us, please accept our best greeting

Best regards.

Président du Comité d'Organisation  
Prof. Ahmed **Melhaoui**

  
SIPAM 3 et CIMB1  
Secrétaire du Comité  
Prof. AHMED MELHAOUI  
29 / 30 Mai 2008  
OUJDA MAROC

# Programme

Mercredi 28 mai 2008 (après midi)		
15h00	Accueil des Participants et Inscription	
17h00	Cérémonie d'ouverture	
Jeudi 29 mai 2008		
8h-9h	Inscription (suite) et Affichage des posters	
9h00 - 9h45	<p style="text-align: center;"><u>Session plénière</u> <i>Modérateurs : Melhaoui A. &amp; Bouali A.</i> <i>(Amphithéâtre Ibn Albannae)</i></p> Conférence Inaugurale 1 <b>New approaches for Fourier transform mass spectrometry applied for biomolecules and complexes structural elucidation based on accurate mass measurements and ion activations.</b> Jean Claude Tabet. Paris, France	
<b>9h45 10h15 : Pause café</b>		
	<p style="text-align: center;"><u>1<sup>ère</sup> Session : Biologie, Pharmacologie, Toxicologie, Phytothérapie</u> <i>Modérateurs : Ziyat A &amp; Atta A.</i> <i>(Amphithéâtre Ibn Albannae)</i></p>	<p style="text-align: center;"><u>1<sup>ère</sup> Session : Phytochimie, Molécules Bioactives, Valorisation</u> <i>Modérateurs : Radi S. &amp; Cheriti A.</i> <i>(Amphithéâtre Al Alami)</i></p>
10h15 - 10h45	Conférence 1 : <b>Les plantes antidiabetiques : ressources naturelles pour le traitement du diabète.</b> Bnouham M. Oujda, Maroc	Conférence 2 : <b>Isolement et identification de molécules bioactives à partir de plantes médicinales du Maroc : cas du <i>Thapsia transtagana</i> et <i>Thapsia villosa</i>.</b> Akssira M. Mohammedia, Maroc.
10h45	<p style="text-align: center;"><u>Communications Orales</u></p> <b>O27- Evaluation biologique et chimique de composés insulino-stimulants à partir de plantes médicinales marocaines.</b> <u>Nmila R.</u> , Rchid H., Gross R., Tijane M. El Jadida, Maroc.	<p style="text-align: center;"><u>Communications Orales</u></p> <b>O1- Isolation and modifications of bioactive alkaloids from <i>Pancreatium canariense</i>.</b> <u>Cedrón JC.</u> , Estévez-Braun A., Ravelo ÁG. Tenerife, Spain.

- Attia H., Ksouri R., Rabhi M. and Lachaâl M. Tunis, Tunisie.
- A125 Antioxidant activity of *Nigella sativa* L. roots and shoots from Tunisia.** Bourgou S., Ksouri R., Bellila A., Falleh H. and Marzouk B. Hammam-Lif, Tunisia.
- A126 A comparison of antioxidant properties between artisan-made and factory-produced chocolate.** Cervellati R., Greco E., Costa S., Guerra MC., Speroni E. Bologna, Italy.
- A127 Investigation of antioxidant, acetylcholinestérase and antimicrobial activities of TOF and decoction extracts of *Cymbopogon schoenanthus* L. (Poaceae).** Khadri A., Lino Rosa L., Luisa M., Serralheiro M., Neffati M., Eduarda M., Araújo M., Smiti S. Tunis, Tunisia.
- A128 Capacité de piégeage des radicaux libres de l'extrait brut de *Crataegus oxyacantha*.** Mohammedi Z. et Atik F. Tlemcen, Algérie.
- A129 Etude de l'activité anti-inflammatoire de l'extrait méthanolique de *Corrigiola telephiifolia* Pourr.** Lakmichi H., Bakhtaoui FZ., Loutfi K., Gadhi CA. Marrakech, Maroc.
- A130 Sélection et caractérisation des substances naturelles aux propriétés immunomodulantes.** El-Youbi El-Hamsas A., Ouahidi I. et Arab L. Fès, Maroc.
- A131 Effet myorelaxant et spasmolytique de Ain larneb (*Globularia alypum* L.) Sur le jéjunum du lapin.** Doukali R., Chokri A. et Bencheikh R. Fès, Maroc.
- A132 Relaxant effect of aqueous extract of *Cistus salvifolius* on rodent intestinal contractions.** Oubenchiker K., Karim A., Mekhfi H., Bnouham M., Ziyat A., Legssyer A., Melhaoui A., Atmani F., Bouali A. and Aziz M., Oujda, Maroc.
- A133 Activite anti-diarrhéique de *Zygophyllum gaetulum*.** Khabbal Y., Ait El Cadi M., Alaoui K., Faouzi MA., Bruno U., Mahraoui L., Cherrah Y. Rabat, Maroc.
- A134 Accumulation and variability of the contents ecdysteroids in medicinal raw material of *Leuzea (rhaponticum) carthamoides*.** Timofeev N.P. Russia.
- A135 Ecologically-biochemical interactions between ecdysteroid producing plants and phytophagans [on example *Rhaponticum carthamoides* and *Serratula coronata* (asteraceae)].** Timofeev N.P. Russia.
- A136 Implication de la mélatonine seule ou combinée avec l'imipramine dans la régulation du niveau de dépression chez le rat.** Ouichou A., Benabid N., Ouakki S., Nasri I., Alaoui N. et Mesfioui A. Kénitra, Maroc.
- A137 Action de la mélatonine en absence ou en présence du diazepam sur le niveau d'anxiété chez le rat.** Mesfioui A., Ouakki S., Nasri I., Benabid N., Alaoui N. et A. Ouichou. Kénitra, Maroc.
- A138 L'effet de *Ficus-carica* et *Zea mays* sur les calculs urinaires majoritaire**

- Jauregui J. and Alvarez Cansino L. Taza, Maroc.
- A179 Impact des conditions hydro halomorphes sur *Zygophyllum album* dans le sud-est Algérien : cas de la cuvette de Ouargla.** Daddi Bouhoum M., Brinis L., Ould El Hadj MD. et Saker ML. Ouargla, Algérie.
- A180 Phylogéographie de l'ADN chloroplastique chez l'arganier étude comparative avec les populations reliques.** El Mousadik A. & Petit R., Agadir, Maroc.
- A181 Molécules actives de *Trichoderma harzianum* et *Rhizobium leguminosarum*.** Essalmani H. Université Tanger, Maroc.
- A182 Culture of aromatic and medicinal plants and the europgap certification.** Bouras M., ElbahrI Y. and Lamarti A. Tetouan, Morocco.
- A183 Multiplication *in vitro* et marquage moléculaire pour la conservation de l'arganier.** Jabbar Y., Majourhat K., Hafidi A et Martinez-Gomez P. Marrakech, Maroc.
- A184 Contribución à l'étude de la capacité organogène *in vitro* de safran (*Crocus sativus* L.).** Rahmoun A., Lage M. and Lamarti A. Tetouan, Maroc.
- A185 Comparative results 4-years cultivation *Rhaponticum carthamoides* (leuzea, maral root) in conditions of Poland and the European north of Russia.** Timofeev N.P. Koryazhma, Russia.
- A186 Salt effect on fatty acid composition of coriander (*Coriandrum sativum* L.) Leaves.** Neffati M. and Marzouk B. Hammam-Lif, Tunisia.
- A187 Effets Du Calibre Des Noyaux Et De Leur Prétraitement Sur La Germination De L'arganier Des Béni-Snassen «*Argania spinosa* (L.) SKEELS ».** Berrichi A., Reda Tazi M., Fouzi K., Bekkouch I., Boukroute A. Oujda, Maroc.
- A188 La multiplication végétative par bouturage de la verveine et de la marjolaine.** Boukroute A, Berrichi A, Reda Tazi M. Oujda, Maroc.
- A 189 Tissues cultures of *Matricaria recutita* L. and chimiotaxonomy.** Errehouni S. and Lamarti A. Tetouan, Morocco.
- A190 Le codium fragil : Identification, caractérisation de la paroi et analyse des métaux lourds.** Ben Gueddour Y., EL Hassouni H., EL Hani S., Abdellaoui D., Gmira N. Ben Gueddour R. Kénitra, Maroc.
- A191 Copper ions biosorption properties of two desert plants: *Anabasis aretioides* and *Acacia raddiana*.** Talhi MF., Benchiekh W., Cheriti A., Belboukhari N. & Roussel C. Bechar, Algeria.
- A192 Propriétés antioxydantes des composés phénoliques des feuilles de *Pistacia lentiscus*.** Nabila Benhammou, Fawzia Atik Bekkara, Tlemcen, Algérie.
- A193 Médicaments à base de plantes: vers une maîtrise de leur qualité et législation au Maroc.** Yahyaoui R. Et Bouchentouf D. Syndicat des pharmaciens d'officine d'Oujda (SRPOO), Oujda - Maroc.