

QUESTIONNAIRE

Please, fill in the Questionnaire and return it to contact person in Moldova:

depintrel@asm.md. Phone: 272254

(* – mandatory fields)

	Details about organisation
* Organisation name	Institute of Genetics & Plant Physiology ASM
Organisation acronym	IGPPH ASM
* Organisation Activity Type (RES - Research, HE - University, SME - Small and Medium Enterprise, IND - Industry, OTH - Other)	RES
* Keywords of main research areas	Genetics, Pant Physiology, Biochemistry, Molecular biology
* Head of organisation (first name, family name)	Anatol Jacota
* Post code	MD-2002
* Country	Republic of Moldova
* City	Chisinau
* Street, House	20 Padurii
* Telephone (+ country & city codes)	(37322)-77-04-47
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* Description of organisation and its research achievements for the last five years (~ 5000 signs)
<p>Main directions of research and results: Ecological Genetics of Crop Plants directed on elucidation of the interference of ontogenetic and phylogenetic systems as a generating source of new genetic variability; Creation of scientific base of gamete and cellular breeding; Highlighting of an integrated system of determining the plant resistance to stress factors; Elaboration of new methods of identification of some humane diseases; Creation of new varieties and hybrids of crop plants with valuable economic characteristics (~40); Determination of mechanisms which ensure exogenous regulation of plant adaptive potential and increasing of productivity; Elaboration of new technologies which permit the diminution of agricultural losses caused by conservation and transportation conditions. More than 1000 new genetic forms of tomato, maize, wheat triticale, beans, ornamental and leguminous plants and about 50 varieties and hybrids of these species were obtained; 15 of them were certified for implementation in Moldova agriculture. The preparations of Natural Plants Growth Regulators (NPGR) were elaborated by extraction active components from different species of plants; their chemical structure and biological activity was determined. Same of the elaborated preparation of NPGR were certified for utilization in Moldova agriculture as integrated components for regulation of plant growth and their protection in organic agriculture.</p>

	Contact Information
* Contact person (first name, family name)	Alexandru Dascaluic
* Department / Laboratory	The Center of Advanced Biological Technologies (CABT)
* Position	Head of the CABT
* Qualification and research experience	Doctor habilitate in biology; professor in biochemistry Plants dormancy and response to stress factors; synthesis of secondary metabolites <i>in vitro</i> and <i>in vivo</i> ; adaptogens.
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International co-operation / Participation in EU RTD programmes or other bilateral / multilateral actions
INTAS, TACIS, TEMPUS, COST, EUREKA, other RTD programmes (please specify programme/s, project title/s and year/s)
<p>1. Influence of Apple Seed Storage Proteins on Embryos Germination Capacity – Fulbright grant, 1999-2000.</p> <p>2. Déterminisme climatique et agronomique de la composition des graines: étude du potentiel productif et de qualité (génétique et climatique) du blé // Grant for the collaboration with the INRA, Clermon-Ferand, France (France, Romania, Moldova, Hungary) 2001-2003.</p> <p>3. Elaboration of Proceedings and Technologies to Obtain and Use Native Substances from Plants in Agriculture and Medicine – CRDF grant, 2001-2004.</p> <p>4. Introduction of <i>Rhodiola rosea</i> L. into Agricultural Production in Moldova – CRDF/MRDA grant, 2002-2005.</p> <p>5. Utilization of fluorometer and implementation of biological active preparations in agriculture – CRDF grant, 2005-2006.</p> <p>6. Maintaining of the Center of Advanced Biological Technologies (CABT) Devices; Support of Young Scientists and Students – CRDF grant 2006-2007.</p> <p>7. Selection and cultivation of <i>Rhodiola rosea</i> L. based on molecular, phytochemical and physiological methods – INTAS grant 2006-2008.</p> <p>8. Application and Improvement of <i>Reglalg</i> for Winter Wheat Seeds Treatment before Sowing to Increase Resistance and Productivity – CRDF/MRDA/AITT grant 2006-2007</p> <p>9. Implementation of <i>Rhodiola rosea</i> in Moldovan agriculture for medicinal use – CRDF grant, 2008-2009.</p> <p>10. The regulation of biosynthesis of secondary metabolites <i>in vitro</i> and <i>in vivo</i>, in cell culture and in plants, and assessment the influences of these compounds on physiological reaction of plants to abiotical (extreme temperatures) and biotical (parasites) stress factors – Cooperation Moldova Russia, 2008-2010.</p>

	* Please, use “X” to indicate the scientific area/s of your potential project
CHEMISTRY	
SOCIAL AND HUMAN SCIENCES	
ECONOMIC SCIENCES	
ENGINEERING SCIENCE	
ENVIRONMENT	X
AGRICULTURE AND FOOD	X
HEALTH	X
MATHEMATICS	
INFORMATION SCIENCE	
PHYSICS	
NANOTECHNOLOGIES	
ENERGY	
TRANSPORT	
SPACE	

* Summary of potential research project envisaged hosting of European researcher for the period of between 1 and 2 years
<p>Control of <i>in Vivo</i> and <i>in Vitro</i> Growth and Accumulation of Secondary Metabolites by <i>Rhodiola rosea</i> L.</p> <p>Golden root (<i>Rhodiola rosea</i> L.) is a valuable medicinal plant that naturally grows in mountains of many parts of the world, including the Carpathian Mountains. It accumulates in the rhizome secondary metabolites that have been shown to possess different medical activities and valuable adaptogenic effects. Because of these properties, golden root has been collected intensively from nature, and is now a rare and endangered species in many parts of the world,</p>

especially in the Carpathian Mountains. We have revealed that during the last several years it has completely disappeared from the Rarau massive of the Romanian Carpathians. During 2003-2007, we have collected different genotypes from Romanian and Ukrainian Carpathian Mountains, as well as some genotypes from Russia and cultivated by some private growers in Ukraine. The conditions for *in vitro* propagation and callus culture were also developed. Propagated plantlets were planted in two field sites of Moldova. Sensitive HPLC methods were developed for quantitative and qualitative analysis of secondary metabolites in *Rhodiola rosea* plants and callus. Chromatographic data was acquired using photodiode array (PDA) detection or atmospheric pressure ionization mass spectrometry (API-MS). Ionization efficiencies with electrospray ionization (ESI) and atmospheric pressure chemical ionization (APCI) were compared under different conditions. Analysis of extracts from the Carpathian rhizomes of *Rhodiola rosea*, revealed the complex mixture of secondary metabolites that includes: phenylpropanoids, phenylethanoids, monoterpenes, flavonoids, coumarins, and organic acids. By the contrast, in the rhizomes obtained in the field conditions of Ukraine and as well in callus cultivated in our laboratory, the content of secondary metabolites was very low and some components are almost absent. **The goal of the proposed project is to determine the effects of some physical and chemical factors on synthesis and accumulation of secondary metabolites in *Rhodiola rosea* grown *in vivo* and *in vitro*.** To achieve this goal, we have identified the following objectives: 1) to elaborate the agro-technical regime of *Rhodiola rosea* plant growth during the first, second, third, and fourth year of cultivation in the field; 2) to determine the heterogeneity of *R. rosea* plants by analyzing physiological and biochemical parameters; 3) to analyze the influence of UV radiation and other stress factors on accumulation of secondary metabolites in *Rhodiola rosea*, grown as callus *in vitro*, and as well *in vivo* in green house, and field conditions in Moldova. The experiments will be provided with selected material obtained from seeds and microclonal propagated plants. In order to identify the influence of external factors on accumulation of secondary metabolites, the research will evaluate plants and callus of different ages, as well as plants at the middle of vegetation period and before transition to dormancy. The work would contribute to the increased knowledge about the biology of *Rhodiola rosea* and conditions of its cultivation for local climatic and soil conditions while still being able to obtain secondary metabolites with adaptogenic effects. At the end of this project we expect to obtain *Rhodiola rosea* vegetative material cultivated in field conditions and *in vitro*, with content of secondary metabolites that is comparable or higher than that characteristic for rhizomes collected in the mountains. The project aims to introduce a new species into agriculture, for the long-term benefit of the rural sector and the environment. The scientific and agronomic problems of introduction of *R. rosea* will be published as practical recommendations and will be presented at conferences and symposia.

	Please, confirm your agreement on data publication and dissemination
I agree with the publication of the data on the web-site http://www.inco-eeca.net , and dissemination among Mobility National Contact Points of the EU MS and AC (YES / NO)	I confirm my agreement on data publication and dissemination.
Date	9 June 2008