Summary report on research accreditation

I. General information

Name of organization	**Institute of Genetics and Plant Physiology of the ASM**
Organization type	**Research institute**
Research mission of organization	The mission of the Institute of Genetic and Plant Physiology of the ASM is: - Elaboration of research priority directions in Genetics and Plant Physiology development connected to world trends; elaboration of high technologies according to the institute themes, development of scientific patents and their implementation in agriculture; - Retraining of the scientific potential through post-university studding courses in Genetics, Plant Physiology, Seed Production and Amelioration, Biochemistry specialties.
Strategic research directions	**The national strategic direction in which the institute projects are referring:** 04: Agricultural biotechnologies, soil fertility and food security. **Fundamental direction:** Genetic and molecular control of the quantitative and qualitative valorous traits; elaboration of the new principles of heritable variability extension and quantification; study of genetic and physiological diversity and plant gene pool conservation; genetic and physiological mechanisms for manipulation of the productive processes. **Applied direction:** Elaboration of the new principles, breeding technologies and biotechnologies; creation of plant varieties and hybrids with high productivity, quality and ecological resistance to different agricultural system; elaboration of genetic and physiological methods of optimization and providing of the production stability in intensive and organic (ecological) agriculture.
Evaluated period	**2006-2010**
Web of organization	**www.igfp.asm.md/**

II. Research capacity (annual average for evaluated period)

Total number of employees	**342.8**					
Number of scientific researches	**152.4**					
Number of researches who possess honorific titles, scientific degrees, scientific and scientific-didactical titles	ASM full members **1.4**	ASM corresp. members **2.6**	Professor **11.2**	Associated professor **38.6**	Dr.hab. **24.4**	Dr. (PhD) **76.8**
Number of researches involved in international projects	FP7 -	STCU **14**	Bilateral **17**	Others **69**		
Number of young researches (under 35	Dr. (PhD) **5**	PhD students **32**	Others **30,6**			

years old)			
Financial resources (thousand MDL)	Public budget **10436.3**	International projects/grants **342.4/510.6**	Research contracts **413.18**
Distribution of expenditures (thousand MDL)	Salary **9096.90**	Infrastructure development **2945.58**	Other **374.12**
Expenditures for infrastructure development (thousand MDL)	Equipments **973.78**	IT infrastructure **721.8**	Endowment of experimental resorts **1250.0**
List of 3 basic research methods, installations, technologies (per accredited field)	- Device for studying plants mezostructure and CO_2 change - equipment for mezostructure examination of photosynthetic apparatus (leaf, reproductive organs, leaf sheath, stem). - Reproductive technology of natural bio-regulators for medical and agriculture needs - extraction procedures of Moldism and Ecostim, natural compounds of glycosidic type from the class of nontoxic natural substances. - Experimental fixture for regimes gas research in regarding of long term keeping of new varieties of apple fruits - plant endowed with control devices and regulating the content of O_2 and CO_2 in the atmosphere boxes, which allows to research and determine optimal concentration of these gases in terms of late apple varieties keeping in controlled atmosphere.		
List of provided scientific services	**Determining the quality of biological material and biochemical analysis of products.** Responsible executor - Dr. habilitatus, prof. DASCALIUC Alexandru. **Increase productivity, production quality, diversification of export production, increase in profit from the cultivation and export of medicinal and aromatic plants (*Silybum marianum, Anethum graveolens*).** Responsible executor - Dr. habilitatus, GONCEARUC Maria **Herbal products using in the natural treatment of different diseases; improve production quality and the increase in profit.** Responsible executor - Dr. habilitatus GONCEARIUC Maria. **Testing fertilizers in technology of vegetable cultivation.** Responsible executor – Dr. ROTARU Vladimir. **Rot pathogens determination in the sugar beet roots.** Responsible executor – Dr. habilitatus LUPASCU Galina. **Preparation attempt and effect demonstration on vegetable crops**. Responsible executor- Dr. habilitatus BOTNARI Vasile.		
List of editorial activities	1. Co-founder of the ***Proceedings of the Academy of Sciences of Moldova. Life Science***. ISSN 1857-064X. 2. Responsible for edition: ***Plant agrobiodiversity.*** Ch.: ASM Press, 2006. 292 p. ISBN 9975-62-149-X. 3. Responsible for edition: ***Vegetal agrobiodiversity in Republic of Moldova: evaluation, storage and utilization.*** Ch.: ASM Press, 2008. 472 p. ISBN 978-9975-62-230-1. 4. Responsible for edition: ***Actual problems in genetics, physiology and plant breeding.*** Proceeding materials of scientific conference Chisinau, October 9-10, 2008, Ch.: Central Press), 2008. 640 p. ISBN		

	978-9975-78-667-6. 5. Responsible for proceeding edition of the ***IX-th International Congress of the Scientific Society of Geneticists and Breeders of the Republic of Moldova***, October, 21-22, 2010, Ch.: Prim SRL Press, 2010. 210 p.

III. Distribution of number of research projects and themes during evaluated period

Evaluated period	**2006**	**2007**	**2008**	**2009**	**2010**
Institutional projects	**7**	**7**	**7**	**7**	**7**
Projects in the frame of State Programmes	**5**	**5**	**4**	**4**	**4**
Technological transfer projects	**3**	**2**	**1**	**1**	**2**
Projects for equipment procurement	**0**	**1**	**0**	**0**	**1**
Projects for young researches	**2**	**1**	**2**	**1**	**1**
Projects in the frame of bilateral programmes	**0**	**0**	**0**	**0**	**2**
International projects/grants	**3/2**	**5/4**	**9/3**	**8/5**	**2/4**
List of 3 representative international projects/grants	**08.820.04.24RF. Regulation of biosynthesis of secondary metabolites in cell and plants culture in vitro and in vivo and assessing the influence of these substances on the physiological reactions to the action of abiotic factors (extreme temperatures) and biotic factors (vermin).** **Period**: 2008-2009 **Scientist:** Dr. habilitatus, professor DASCALIUC Alexandru. **10.820.04.13BF. Morphogenetic, physiological biochemical and bioenergetics features of plants (*Triticale, Secalotriticum*) on training of productivity in different ecological conditions.** **Period**: 2010-2011 **Scientist**: Dr. habilitatus, professor BALAUR Nicolae. **Exploring, collecting and characterizing the local forms of industrial crops from SEEDNet area** **Period:** 2008-2009 **Scientist: Dr. Ganea Anatolie**				
Research contracts	2006 **2**	2007 **1**	2008 **0**	2009 **3**	2010 **4**
List of 3 representative research contracts	1. Contact nr. C-03 2010, implementation of *Anethum graveolens* variety, 30 ha, named Ambassador, on EsentEx Co. Objectives: increase of productivity of *Anethum graveolens* plantations, quality of essential oil improvement; profit increase. Responsible executor - Dr. habilitatus GONCEARIUC Maria. 2. Contract nr.C-04 2010, implementation of *Salvia sclarea*, Dacia-50, Dacia 99, Victor, Nataly, Clary varieties on EsentEx Co. Objectives: increasing of productivity of clary (*Salvia sclarea*) plantations, the				

	plantation exploitation about 3 year instead of 2 years, improvement of product quality, price cost reduction, profit improvement. Totally 845 kg seeds by 200ha. Sum: 48.000 lei. Responsible executor - Dr. habilitatus GONCEARIUC Maria. 3. Contract nr. 07-32/ 17-4 from 18 July 2010 signed with State Center for certification and approval of plant protection products and fertilizers. Sum: 5.400 USA dollars. Effectiveness of CAM-05-WGE products as herbicide on seeded potatoes and tomatoes. Responsible executor - Dr. habilitatus BOTNARI Vasile. 4. Contract nr. 01-32/26-5 from 24 July 2010 signed with State Center for certification and approval of plant protection products and fertilizers. Sum: 6.750 USA dollars. Effectiveness of 273,5 FS products as fungicides in treatment of the potato tubers. Responsible executor - BOTNARI Vasile.

IV. Scientific publications

Total number of publications abroad	Books **0**	Chapters in books **9**	Journal papers **54**
Total number of publications in ISI journals and books	Books **6**	Chapters in books **9**	Journal papers **54**
Total number of publications in the country	Books **6**	Chapters in books **4**	Journal papers **190**
Total number of conference abstracts	International abroad **85**	International in the country **83**	National **0**
List of 5 representative publications (per accredited field)	1. CHIRIAC, GH.; ANDRONIC, L.; BUJOREANU, V.; MARII, L. Features of crossing – over in virus-infected plants. *Central European Journal of Biology*. 2006, 1(3), 1–13. 2. GONCEARIUC, M.; BALMUŞ, Z.; COTELEA, L. *Salvia sclarea* L. Precocious stepwise and backcross hybrids. *Romanian Biological Sciences*. 2007, 5(1/2), 54-55. ISSN 1584-0158. 3. BALAUR, N.S.; VORONȚOV, V.A.; KLEIMAN E.I.; TON YU, D. Novel Technique for Component Monitoring. of CO_2. Exchange in Plants. *Russian Journal of Plant Physiology*. 2009, 56(3), 423-427. (FI: 0,5). ISSN 1021-4437. 4. ROTARU, V.; SINCLAIR, T. Interactive influence of phosphorus and iron on nitrogen fixation by soybean. *Environ. Exp. Botany*. 2009, nr.1, p. 94-99. (IF 2.569). 5. ANISIMOVA, I.N.; TUMANOVA, L.G.; GAVRILOVA, V.A.; DIAGILEVA, A.V.; PASHA, L.I.; MITIN,V.A.; TIMOFEEVA, G.I. Instability of genome of interspecific hybrids. *Genetics.* 2009,45(8), 1067-1077. (FI: 0,268).	
List of 5 citations	1. ANISIMOVA, I.N.; TUMANOVA, L.G.; GAVRILOVA, V.A.; DIAGILEVA, A.V.; PASHA, L.I.; MITIN,V.A.; TIMOFEEVA, G.I. Instability of genome of interspecific hybrids. *Genetics.* 2009,45(8), 1067-1077. (FI: 0,268). 2. BALAUR, N.S.; VORONȚOV, V.A.; KLEIMAN E.I.; TON YU, D. Novel Technique for Component Monitoring. of CO_2. Exchange in Plants. *Russian Journal of Plant Physiology*. 2009, **56**(3), 423-427.	

	(FI: 0,5). ISSN 1021-4437. 3. DASCALIUC, A.; RALEA, T.; CUZA P. Influence of heat shock on chlorophyll fluorescence of white oak (*Quercus pubescens* Wild). *Photosintetica*. 2007, 45(3), 469-471. 4. GONCEARIUC, M. Some breeding results of Silybum marianum Gaertn. *Romanian Biological Sciences*. 2007, 5(1/2), 52-53. ISSN 1584-0158. 5. MARII, L.; CHIRIAC, GH. The role of viral infection in inducing variability in virus-free progeny in tomato. Journal of Integrative Plant Biology, 2009. Vol. 51 (5), p. 476–488, (FI: 0,492).

V. Innovation outputs

Total number of patents	Registered in the country 86	Registered abroad 4	Implemented 42
Total number of new developed methods and technologies	Registered 54	Non-registered 18	Implemented 16
Total number of new scientific products	Registered 43	Non-registered 5	Implemented 14
Total number of scientific outputs for central and local authorities (draft of law, strategies etc.)	5		
Total number of scientific outputs for educational institutions	Handbooks for high education 3	Handbooks for pre-university institutions 0	Delivered university courses 18
List of 5 representative innovation outputs (per accredited field)	- Implementation of production technology of natural bio-regulators on agricultural and medical needs. - Implementation of two *Salvia sclarea* L. varieties and one of *Anethum graveolens* L. in growing and processing industry of oil plants. - Implementation of technology its preserve for obtaining ecological raspberry. - Implementation of technology of Reglalg application into obtaining system of organic production in Moldavian viticulture. - Application of Microcom-V in viticulture for resistance and plant productivity increasing.		

VI. Major scientific and innovation achievements

Short description of main scientific results and its confirmation (by awards, citations, development of international projects etc.)	The main institute results have been referring to different genetic, physiologic, and biochemical aspects of the resistance and productivity in various culture (cereals, legumes, vegetables, technical and horticultural cultures), based on the principles of the endogenous and exogenous potential coordination to the negative influence of the climatic, soil drought, biotic factors. Based on the molecular researches, effective markers were found, which were proposed for genotyping of the different varieties and hybrids

	of tomatoes, corn, soybeans and grapevines. As result of screening on selective tools, new forms of tomatoes, wheat, spring barley were obtained, with improved agronomical important traits through *in vivo* and *in vitro* mutagenesis, inter-specific recombinogenesis. For the first time, it was revealed that in C_3 (cereals genotypes) the C_3 type of photosynthesis is typical for leafs, while the other plant organs with photosynthetic activities (spike, stem, glumes) show the C_4 characteristics. This phenomenon was established both for tomatoes and soybean, presenting new opportunities for C_3 plant reconstruction with high productivity. It was noted the contribution of genetic and conditions factors, as well as their interactions, on the formation of the valuable quantitative characters, such as wheat and tomatoes resistance and productivity. It was demonstrated a wide range of the separate steroidal glycosides influence of in complex with Zn and Mn microelements on apricots and peach plants crop quantity and quality. It was elaborated, patented and implemented a new fertilizing compound "Microcom" for foliate treatment in order to diminish the impact of soil drought and fortification the health status. It was revealed that the plant tolerance to the unfavorable conditions depends on the Fe, P, Ni and anions dose and ratio, which is expressed in microelements and protective substance accumulation.				
Number of organization' invited speakers at international conferences	2006 12	2007 9	2008 7	2009 4	2010 6
Short description of technological transfer and innovation results and its certification by implementation	21 new varieties of cereals (cv. Moldova 11, cv. Arnaut 7, cv. Hordeiforme 335, cv. Ingen 33, cv. Ingen 35, cv. Saltaret); tomato (cv. Elvira, cv. Jubiliar 60/20, cv. Mihaela, cv. Prestij); medicinal and aromatic plants (cv. Ambra Plus, cv. Nataly Clary, cv. Aromat, cv. Agat); legumes (cv. Geca 5, cv. Bogdan, cv. Aurie, cv. Verzuie, cv. Albişoara, cv. Amelia, cv. Clavera) were created and approved. It was obtained and evaluated the composition and structure of steroidal glycosides derived from *Veronica chamaedrys* L. (8), *Verbascum densiflorum* Bertol. (3), *Physalis floridana* Rydb (2), compounds "Microcom", "Reglalg".				
Number of defended dr.hab. and dr. theses per year	2006 **0/0**	2007 **0/2**	2008 **0/3**	2009 **0/3**	2010 **1/6**

VII. Present/further involvement in the Seventh Framework Programme (FP7): specific programmes (Cooperation, Ideas, People, Capacities) of interest and its sub-divisions.

The field of interest for further involvment: genomic analysis of several valorous cultures (cereals, vegetables, aromatic and medical plants) for identification and assessment of responsible loci on valorous characters (productivity and resistance) used in improvement.

VIII. Accredited research field and its evaluation by the National Council for Accreditation and Attestation of the Republic of Moldova

Accredited research field: **Genetics, physiology and plant breeding**

Evaluation: **Good**

IX. Category (A/B/C) attributed by the National Council for Accreditation and Attestation of the Republic of Moldova to the organization

Category A

X. Institutional development actions planned for the next 5 years.

Elaboration of new principles and untraditional technologies for plants improvement (cereals, vegetables, aromatic and medical plants).

Physiological and biochemical study of genetic mechanisms involved in productivity optimization of culture plants.

Application of *in vitro* biotechnology in increasing of somatic variation, in microcloning, somatic embryogenesis, callusogenesis etc.

Evaluation of *in vitro* development control. Creation and selection of the new forms that combines productivity, quality and increased environmental resistance. Application of the nested-PCR method in molecular evaluation.

Collection, *ex situ* and *in situ* conservation and documentation of cultivated plants and their wild ancestors (Cereals, Legumes, Vegetables, Medicinal and Aromatic Plants and Endemic Species), *in vitro* conservation of samples with agronomical perspectives.

Determination of the influence of biological active substance, macro- and microelements on growing, resistance and plant productivity.

Genetic and physiological assessment of natural bio-regulators for increasing the productivity and resistance potentials.

Evaluation of the secondary metabolites and their role in the biosystems adaptation to stress factors.

Determination of the impact of exogenous substances, degree of maturation and the hypoxia on fruit quality and resistance to fungal diseases and functional disorders in the post-harvest.

Establishment of relationships between labs, institutes in prospecting research on extending the resistance to biotic and abiotic unfavorable factors in association with some molecular markers in some cultivated species (tomato, maize, soy, wheat and grapevine).