

**UW College of Agriculture and Natural Resources  
Global Perspectives Grant Program  
REPORT**

**Award Period (e.g. Spring 2012): Fall, 2013**

**Duration of Project: June 5, 2014-June 1, 2015**

**Principle Investigator(s) Dr. Valtcho Jeliaskov**

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**Project Title from Application: Development of Research Collaboration with Switzerland and Bulgaria**

**Amount spent: \$7,468.58.**

**Note:** The above does not include the air fare.

### **SUMMARY**

This project had two goals in teaching and research: (1) Increase Global Perspective contents of my current classes: AECL 4190/PLNT 5190 Herbs, Spices, & Medicinal Plants; and AECL 4120/PLNT 5120 Organic Food Production. (2) To advance existing research collaboration with my colleagues in Switzerland and Bulgaria, and to establish new collaborations with colleagues in France and Italy. This project was designed to expand the international component /global perspective of both my research and teaching programs, which serve the CANR strategic plan. To meet the project objectives, I visited universities, colleagues, and private companies in Switzerland, France, Italy, and Bulgaria. During these visits, Dr. Jeliaskov discussed opportunities for joined project proposals with his international collaborators in these European countries. Dr. Jeliaskov visited essential oil and herb production, processing and research facilities in these four countries. These visits provided Dr. Jeliaskov with the unique opportunity to learn about the production, research and utilization aspects of essential oil and medicinal plants. Dr. Jeliaskov visited some of the leading research, production, development, and processing facilities for medicinal plants and development of medicinal plant products in Switzerland, France, Italy, and in Bulgaria. The information from these visits will be incorporated into Dr. Jeliaskov's classes, (4190/5190 Herbs, Spices, & Medicinal Plants, and 4120/5120 Organic Food Production), thus expanding their global perspectives. A textbook will be written for each of these classes to facilitate the students. Dr. Jeliaskov discussed further collaborative research with his colleagues in Switzerland and Bulgaria, and also developing new collaborative efforts with colleagues from France and Italy. It is expected that this project will contribute to development of new cultivars from aromatic and medicinal plants, enhancing the global perspective of my two courses at UW, and may ultimately benefit UW, COANR, and Wyoming.

## REPORT

The specific objectives of this project were: In Teaching: (1) Expand Global Perspectives contents in teaching of my current classes: 4190/5190 Herbs, Spices, & Medicinal Plants, and 4120/5120 Organic Food Production. In Research: To strengthen/ reinforce existing research collaboration between my program at UW and my collaborators in Switzerland, France, Italy, and in Bulgaria.

### Major Results could be summarized as follows:

1. I visited colleagues and institutions in 4 different European countries.
2. In Switzerland, I visited Dr. Xavier Simonnet in Mediplant with whom we had previously developed collaborative work on *Artemisia annua*. I became familiar with the selection and breeding work at Mediplant. The two of us visited the only essential oil distillation facility in Switzerland, a production and processing facility of a Swiss Association for Medical Plants, and also few private producers of medicinal plants in Southern Switzerland and in the Alps.
3. Also in Switzerland, I visited the internationally known Research Institute of Organic Agriculture (FiBL, <http://www.fibl.org/en/switzerland>). As indicated on its website, "It (FiBL) is one of the world's leading research and information centres for organic agriculture and employs over 135 experts". I made presentation about the UW and COANR. I met with Prof. Dr. h.c. Urs Niggli and other researchers at the Institute to discuss collaborative research and teaching activities, as well as a potential MOU with UW. We visited the FiBL bio-dynamic farm, which conducts research projects on advanced organic farming methods for Switzerland and other countries. The FiBL scientist arranged visits for two organic farms in northern Switzerland; one on vegetable and herbs production, and another one on field crops and cattle production.
4. In France, I visited the laboratory of prof. Farid Chemat at Université d'Avignon. Prof Chemat is a world top scientist, and a director, Responsable du Groupe de Recherche en Eco-Extraction des produits Naturels. Dr. Chemat and his group are researching improved distillation and extraction methods for essential oils, research that is very similar to some of the work I am doing. I toured the facility, made a presentation, and then Dr. Chemat made another presentation about his group's work. The two of us and his group discussed opportunities for collaborative projects. I also visited 3 essential oil production facilities and museums in Grasse, France. In addition, I visited the famous botanical garden in Monaco (Jardin Exotique de Monaco).
5. In Italy, I visited Dr. Massimo Maffei's laboratory at the University of Turin. Dr. Maffei is a very well-known researcher in essential oil and medicinal plants physiology and plant secondary metabolites. I made a presentation about UW and about my research. Next day, the two of us visited a production, development and processing essential oil and other aromatic chemicals facility outside Turin. After that, the professors and the owner of the facility visited a large private farm that is producing peppermint and is actually extracting peppermint at the farm. We followed with a long discussion on potential for collaborative research and about Prof. Maffei and Mr. Parato visiting the United States and participating at the Symposium on Essential Oils and Essential Oil Crops.
6. In Bulgaria, I visited several research institutes, private companies dealing with medicinal and aromatic plants research and development, essential oil extraction

facilities, organic certification associations, small organic producers, including small bee honey producer, small chocolate producer, and small producer of hand-made crackers and snacks. I made presentations about the UW and about my research at different institutes: AgroBioInstitute in Sofia (<http://www.abi.bg/index.php?lang=en>), Institute of Agriculture and Seed Science, IASS "Obraztsov chiflik" – Rousse (<http://izs-ruse.org/en/>), Institute of Agriculture in Karnobat, Research Institute for Roses and Aromatic Plants in Kazanluk (<http://irem.k.net/en/index.php#>). In addition, I visited the Dobrudja Agricultural Institute General Toshevo near Dobrich (<http://www.dai-gt.org/bg/index.php?page=home>), Agricultural University in Plovdiv (<http://www.au-plovdiv.bg/en/>), the Ministry of Agriculture and Food (<http://www.mzh.government.bg/mzh/en/Home.aspx>), The Bulgarian American Commission for Educational Exchange in Sofia, (<http://www.fulbright.bg/en/p-About-Fulbright-Bulgarian-American-Commission-for-Educational-Exchange-1/>), and several other private organizations. I met with a number of researchers, private producers large and small, with the Minister of Agriculture and Food. We have discussed joint project proposal, the current projects on the development of new cultivars of aromatic and medicinal plants, and possibilities for exchange of students and faculty. As part of my visit I also worked with colleagues to evaluate promising chemotypes of lavender and peppermint. In addition, I met with the Rector (President) and vice rector of the Agricultural University in Plovdiv and we initiated MOU with UW.

#### **Future plans**

1. Work on joint research proposals with colleagues from the 4 countries.
2. Work on identifying mobility grants for students and faculty from Switzerland, France, Italy, and Bulgaria and the United States.
3. To accomplish the development and signing of the MOU between the University of Wyoming and Agricultural University in Plovdiv, Bulgaria.
4. Writing on couple of manuscripts from existing ongoing projects.

#### **Outline of the potential impacts to a) the College of Agriculture and Natural Resources, b) the University of Wyoming, and c) the State of Wyoming**

1. This project is expected to help with the development of international linkages and improving the international exposure of the UW and the COANR.
2. The presentations Dr. Jeliakov made in different countries and institutions may stimulate foreign students to apply to UW.
3. The materials I gathered during my visits to the 4 European countries will be used to update the UW classes I am teaching: AECL 4190/PLNT Herbs, Spices & Medicinal Plants PLNT 5190 Herbs, Spices & Medicinal Plants, and AECL 4120/PLNT 5120 Organic Food Production. In addition, some of the materials will be included in a textbook and manual, specifically designed for the above classes.
4. Future collaborative project may benefit UW and COANR students.
5. Some of the ongoing collaborative selection and breeding work may culminate in new cultivar development, which in turn could benefit the UW and producers in Wyoming.
6. The MOU with the Agricultural University in Bulgaria may stimulate student and faculty exchange between Bulgaria and the United States.



**Switzerland:** Visit an essential oil distillation facility around Geneva (from left to right: Dr. Jeliaskov, a Swiss colleague, and the owner of the distillation facility). Students are helping with the essential oil extraction from Douglas fir (right).



**Switzerland:** Herb production high in the Alps (left). Edelwaiss production in the Alps (middle). Some of the ice tea products of the The Valplantes Co-operative that include herbal extracts.



**Switzerland:** Dr. Urs Niggli, director of the Research Institute of Organic Agriculture (left). Dr. Jeliaskov is testing raw milk from the Biodynamic farm of FiBL (right).



**Switzerland:** Hail protection nets above the orchard at the Biodynamic farm at FiBL (right). Cherries, ready to be picked up at the same Biodynamic farm (right).



**Switzerland:** Organic produce at Biomeier farm ready to be shipped to local customers.



**France:** Dr. Jeliaskov's presentation at the University of Avignon (left). Dr. Chemat and Dr. Jeliaskov (right).



**France:** Some of the commercial products (aromatic cooking and salad oils) developed by Prof. Chemat's laboratory. Distillation equipment at Grasse, France (right).



**Italy:** Visiting a commercial oil and aroma company in the Turin region: prof. Maffei, Dr. Jeliaskov and Mr. Parato, the owner of the company in the Turin region (left). Visit to a peppermint production field in Torino region (right) and a private farm with a small essential oil extraction facility in Italy.



**Bulgaria:** Visit the Research Institute for Roses Aromatic and Medicinal Plants, colleagues from the Institute and private producers.



**Bulgaria:** Large extraction facilities of the Research Institute for Roses Aromatic and Medicinal Plants (left), and some of the products that include essential oils from the Institute (right.)



**Bulgaria:** Visit a small certified organic apiary and honey production facility in the town of Kalofer.



**Bulgaria:** Visit BioStyle, a small certified organic production facility for handmade crackers in the town of Katunitsa. Some of the products on the left, and the owner at a trade show (right).



**Bulgaria:** Visit Gaillot Chocolate, a small certified organic production facility for handmade specialty chocolates in the city of Plovdiv. Ground cocoa beans, chocolate, cocoa tea, (some of the products) on the left, the company owner and staff on the right.



**Bulgaria:** Visit the Institute of Agriculture and Seed Science near the city of Rousse (left). Visit the AgroBioInstitute in Sofia. Tour of the facility with Dr. S. Slavov, scientific secretary of the Institute (right).



**Bulgaria:** Visit the Institute of Agriculture in Karnobat: With colleagues at the Institute (left), and barley selection field at the same Institute (right).