

Scientific Report – ESF Exchange Grant 2009

**Mediterranean Climate Variability and Predictability
(MedCLIVAR)**

Reference Number: 2173

Applicant's name: Miss Hela SAADI

Project Title: PHENOLOGY AS A TOOL FOR THE REVISION OF THE BIOCLIMATIC CARTOGRAPHY AND THE STUDY OF CLIMATE CHANGE IN TUNISIA.

Applicant's Institution: Faculté des Sciences Humaines et sociale de Tunis.

Host Institution: Group PHENOTOP / Geography Institute - Bern University.

Supervisor: Professor François Jeanneret, Bern, Switzerland
(francois.jeanneret@sis.edube.ch)

Starting date / Length: 18.02.2009 / 6 weeks

PURPOSE OF THE VISIT:

Because the research in the field of the phenology of plants is very limited in Tunisia, the ESF grant represented a very big opportunity for me to establish contact with European scientists and to explore the works within this domain.

Our initial plan was to contact a large number of researchers in several European countries and to exchange experience.

To achieve our goal, an initial plan had been scheduled before our journey and many contacts were maintained during the three and a half months which separated the declaration of the obtaining of the grant and the date of the beginning of the training course with many scientists in several countries. An application for participation in a European congress on the phenology in Geisenheim (Germany) was also sent.

The following table presents the initial plan:

Date	Institute
19/02	Switzerland Federal Research Institute WSL Sottostazione Sud delle Alpi.
22/02 au 02/03	Geography Institute, University of Berne, Research Group PHENOTOP Phenology – Topoclimatology – Landscape Geography
	National Centre of Competence in Climate Research (NCCR) Oeschger Centre for Climate Change Research OCCR
02/03	Federal Office of Meteorology and Climatology (Payerne)
03/03 au 08/03	Federal Office of Meteorology and Climatology MeteoSwitzerland
	ETH Zurich Institute of Plant Sciences – Grassland Group
09 au 13/03	Final Congress COST 725 "Establishing a European Phenological Data Platform for Climatological Applications".
	Offenbach/Germany Phenological Network of the Deutscher Wetterdienst (DWD)
15/03	Switzerland Federal Research Institute WSL Birmensdorf
16 au 25/03	Geography Institute / University of Berne
	Geography Institute, University of Berne, Research Group KLIMET Climatology and Meteorology
27/03	Università di Bologna BES - Dipartimento di Biologia Evoluzionistica Sperimentale

DESCRIPTION OF THE WORK CARRIED OUT DURING THE VISIT

Station 1: Switzerland Federal Institute for Forest, Snow and Landscape

Research(WSL)/Bellinzona

<http://www.wsl.ch/index>

Purpose of visit:

*Contact Mr. Marco Conedera, who worked on the phenology of chestnut trees and who has publications on this subject.

*find contact in the alpine part of Switzerland which has a Mediterranean touch, thus helping to see and to discuss the possibilities of collaboration in our research domain.

Program of the visit:

*Presentation of the project of research followed by a discussion with the researchers of the WSL.

*Discussion with Mr. Marco Conedera on phenology observations of the chestnut trees, the methodology followed, techniques used and the current projects.

Station 2: Geography Institute, University of Berne, Research Group PHENOTOP Phenology – Topoclimatology – Landscape Geography.

Representation of the station: it is the main station of our stay in Switzerland. We were invited by Professor François Jeanneret / Group PHENOTOP.

<http://www.geography.unibe.ch/lenya/giub/live/research/phenotop/Personen.html>.

The group PHENOTOP works on two related domains: a topoclimatic biomonitoring with phenology and a landscape geography. The main domains are the observation of changes in time and spatial assessment of landscapes.

Our stay in Bern was realized over two separate periods, one at the beginning of the training course and the other one at the end.

The purposes and the projects of this group coincide very well with our objectives of the training course. Switzerland being a country which benefits of an ancient network of the phenological observations and the University of Bern has a good experience in this domain by the setting-up of a specific network in the region " BernClim : the Bernese topoclimatic network " dedicated to the research and the works of the groups of scientists of the Institute of the Geography.

Mr. François Jeanneret, the supervisor of our training course, has a wide experience and very innovative ideas within this domain. Multiple discussions that touched upon several subjects

were envisaged: the phenology in Tunisia, my research project, presentation of the projects of researches on the phenology of plants in Bern and in Switzerland generally.

The first period in Bern:

- Discussions with Mr. F. Jeanneret.
- Work on the project that I presented at Germany congress.
- Discussions with the members of the group PHNOTOP.
- Consultation of the bibliographical references.
- Attendance of Professor F. Jeanneret phenology course for Master students.

The second period in Bern:

- Discussions with Mr. F. Jeanneret.
- Presentation of the course of phenology for Master students.
- Presentation of the group in the seminar: Climatology and Meteorology Research Group.
- Varied discussion about my research project and the possibilities of analyzing data collected during two years in North Tunisia (statistic treatments, mapping, use of the satellite images...).
- Discussions with several researchers of both groups: PHENOTOP and National Centers of Competence in Climate Research (NCCR) Oeschger Centre for Climate Change Research OCCR.

Station 3: Federal Office of Meteorology and Climatology (Payerne)

Objective of the visit: meet Mr. Bernard Clot who is a scientist working on the phenology of plants and having a rich experience in the field of the observers' training on the phenology phases of plants of Switzerland Weather service.

Visit Program:

- Presentation of my project of research followed by a debate.
- Visit of the phenological garden of Switzerland Weather service in Payerne.
- Consultation of the documentation in connection with the subject of the phenology and the climate.

Station 4: ETH Zurich, Institute of Plant Sciences – Grassland Group

<http://www.gl.ipw.agrl.ethz.ch/news/index>

Purpose of the visit: meet the scientists of the Grassland Sciences Group.

Program:

- presentation of the research project
- Discussion

Learning about the last techniques in the field of the phenology: the use of digital cameras
« Use of digital images to observe forest phenology and drought stress ».

Station 5: Switzerland Federal Office of Meteorology and Climatology

http://www.meteosuisse.admin.ch/web/fr/climat/climat_en_suisse/phenologique.html.

Federal Office of Meteorology and Climatology is the manager of all the network of the phenology observations in Switzerland. The target of our visit was to acquire a close knowledge of the specificities of this network and to look for further possibilities of collaboration in this domain.

Program:

- presentation of my project
- Discussion
- Consultation of the last projects on the phenology and the researches made from the historic data
- Relation phenology / climate and the manners to use the data of meteorological stations for the treatment and the comparison with the phenological data.

Station 6: Final conference of COST 725 bringing together vegetation phenologists and climatologists: *International Conference on Scope and current limits of linking phenology and climatology* "Establishing a European Phenological Data Platform for Climatological Applications and in cooperation with the German Weather Service (DWD).

<http://www.campus-geisenheim.de/Program.2950.0.html>

Geisenheim Research Center, Germany, 10. - 12.03.2009

The congress of Geisenheim represented a real opportunity to make contacts with the European scientists who work on the phenology and to undertake relations for forthcoming collaboration.

Our presentation which bears the same title as our present plan of training course “**Phenology as a tool for the revision of the bioclimatic cartography and the study of climate change in Tunisia**“ Was programmed for 10.03.09 at 3:10 pm.

Multiple discussions were envisaged during the days of the congress with the great specialists of the domain and the PhD students on the new projects.

Station 7: Offenbach/Germany: Phenological Network of the Deutscher Wetterdienst

We took the opportunity of being in Germany to visit the DWD [http:// www.dwd.de](http://www.dwd.de). The centre which manages all the phenological data in Germany.

The program:

- Visit of the Center and explanation of the way of data collection and the organization of the system of the phenological observations.
- Visit of the Botanical garden; explanation of the methods of observation and data processing.
- Consultation of the archives of the observations and the presentation of the history of the phenological observations in Germany.

Station 8: Switzerland Federal Research Institute WSL Birmensdorf

http://www.wsl.ch/info/stao/index_FR?redir=1&

The federal Institute of researches on the forest, the snow and the landscape WSL of Birmensdorf realizes researches on Switzerland forests and shelters the unique phenological garden of the country.

We aimed at presenting our research project to the center researchers and at visiting the phenological garden.

An important debate was undertaken with the researchers of the center about the techniques of the phenological observations, the manners of reconstruction of past climates, the studies of the forest species ...

Station 9: Università di Bologna BES - Dipartimento di Biologia Evoluzionistica Sperimentale

<http://www.biologia.unibo.it/BES/Dipartimento/default.htm>

In the end of our training course, a visit was accomplished in the Department of Biology of the University of Bologna, Italy.

The purpose of our visit was to contact the researchers who work on Mediterranean species to find possibilities of potential collaborations.

The program of visit

- Meeting with the group of researchers who work on the phenology.
- Visit of the phenological garden of Bologna, presentation of the techniques of observations and stocking of data.
- Presentation of personal work.
- Debate regarding the possibilities of collaboration is shared with the group of Bologna as well as the other groups working on the phenology in Italy.

DESCRIPTION OF THE MAIN RESULTS OBTAINED

* To build a network of contact with the scientists who work on the domain of the phenology of plants

During this training course, we were able to widen the circle of our knowledge. The considerable discussions with the researchers in every visit have allowed exchanging ideas, to estimate the work, to resolve certain problems and to look for possibilities of further fruitful collaborations.

The Geisenheim congress (Germany) helped us a lot to contact the main researchers in Europe.

*To consult closely the techniques of the monitoring and the collection and storage of phenological information according to both networks of Switzerland and Germany.

The visits of the **Switzerland Federal Office of Meteorology and Climatology** and the **Phenological Network of the Deutscher Wetterdienst (DWD)** in Germany, both bodies which group the data of phenological observations in these two countries offered us the chance to closely see the techniques and methods used to manage this big quantity of information and to realize works in various subjects of researches as well.

* Final conference of COST 725 bringing together vegetation phenologists and climatologists: *International Conference on Scope and current limits of linking phenology and climatology*

A work which has the title and the subject of our current training course supported by MedCLIVAR was presented during this congress. A specific thanking for the financing of the ESF was mentioned at the beginning of the presentation, and the abbreviation was inserted into the front page of presentation.

This presentation in this important scientific congress was elaborated within the framework of this training course and in association with our supervisor the professor François Jeanneret. The congress of Geisenheim represented a true opportunity for me. First, because its subject is totally in the context of my researches. Then, the meeting of all this number of scientists in the same place during the days of the congress allows exchanges, debates and plans of collaboration and common jobs.

The debate with Mrs Isabel Chuine, CNRS Montpellier, France, enabled us to draw a plan to begin a data processing of our phenological observations in Tunisia. Besides, the meeting of Mrs Annette Menzel of the University of Munich, Germany allowed to draw a plan for a training period under its supervision in October, 2009.

*The contact with the different members of the group PHENOTOP and the Climatology and Meteorology Research Group in Bern has created very interesting debates.

New ideas have been born as Mediterranean plan to know about the state of researches in the field of the phenology especially in the countries of the south Mediterranean Sea.

During our second period of stay in Bern, several tasks were performed to find persons working in this realm.

Now we have secured a good number of contacts with researchers from all over the world: Spain, France, Italy, Croatia, Algeria and we are still in search of other contacts, our primary target will be to introduce the situation of researches in the field of the phenology in Mediterranean Sea.

A second plan will be performed to reach a common work on plant phenology of the Quercus in Mediterranean Sea (Tunisia, Italy, Croatia, Spain) and in this context a letter was addressed to professor Giovanna Puppi (Botanica Sistemica, Dipartimento di Biologia E. S. Università di Bologna – Italy).

The letter text:

Subject: Application for a launch of a phenology monitoring of *Quercus* species in the forests of the neighborhood of Bologna and whole Italy.

Madam and dear Colleague,

Following our discussion of March 27th, 2009 in your department in Bologna, about the phenology in general and possibilities of collaborations between Tunisia and Italy in this research domain, I send you this application to look for the possibilities of organizing common observations between Tunisia (the North) and Italy (Bologna) in some sorts of similar *Quercus*.

Tunisia and Italy share several points in common at the geographical and natural level and the launch of such project will undoubtedly constitute a good idea for the study and the comparison of the behavior of the *Quercus* sorts between both regions and within the Mediterranean Basin. So, by containing both countries, it would be even possible to draw a phenology transect North-south representative almost continuous stretching the Tunisian Dorsale, the length of the Apennine Mountains up to the South of the Alps.

Given the fact that phenology is an ill-practiced research domain in our Mediterranean area, collaboration between our countries and institutions will enable us to make a first step to gather partners in several countries particularly those touched by the climatic modifications and their consequences on the biosphere and the environment. The phenological observations of trees are particularly indicated for a long-term monitoring.

This invitation, although sent at first to the team of the University of Bologna, concerns all the Italian scientists who want to join us in this project starting from this spring, 2009 the observations of one or several sorts of *Quercus* which have already been subject of phenological observations in Tunisia since spring, 2008 (*Q. faginea*, *Q. to suber*, *Q. coccifera* and *ilex Q.*).

The present letter constitutes a first contact on the way of a trans-Mediterranean phonological initiative to launch a long-term collaboration between both parts, Tunisian and Italian, and will be certainly followed by other exchanges to fix the frame and the methodology of the observations and to obtain comparable data.

Sincerely Yours.

FUTURE COLLABORATION WITH HOST INSTITUTE

The enriching supervision which I have found during our stay in Bern and the very good atmosphere I have experienced there leads us to think about future plans with the group PHENOTOP and the professor François Jeanneret. Thanks to the Bern group, who proved extremely helpful, we are on the way of learning techniques to analyze data and we are now acquiring major skills in the process.

The Institute of Geography is willing to continue to support a trans-Mediterranean collaboration in phenology, especially the idea of a transect between Tunisia and the Alps. Dr This Rutishauser, actually for one year in Spain, will also contribute to this effort.

PROJECTED PUBLICATIONS / ARTICLES RESULTING OR TO RESULT FROM THE GRANT

As already mentioned, part of future collaborations will try to compare the phenological behavior of Quercus species in several Mediterranean countries (Tunisia, Spain, Italy and Croatia) during spring, 2009.

We must first collect observations during 2009 spring and then we are going to begin the work of treatment and analysis of these data.

On the other hand, we are working with Professor Isabelle Chuine to analyze our collected data.

These two projects will be sent to MedCLIVAR as soon as they are finished. Certainly all our publications will pay tribute and thank to the financial support of the project: MedCLIVAR and ESF.

OTHER COMMENTS

1. Explanation for the travel costs:

Given the specificity of our initial program which had as purpose establishment of numerous contacts with scientists from several regions in Switzerland and outside, and our participation at the congress of Geisenheim in Germany (section 1: Description of the work carried out during the visit), we realized several journeys by train which cost a lot to us although we tried to look for the cheapest solution with the purchase of Eurail pass from Tunisia.

We beg you to consider these exceptional expenses and refund us for all the sum of the allowance of the travel.

Total cost of the plan ticket is 598.5 Dinars (about 332€)

Total cost of the train tickets is 360.00€ (see receipt).

2. Copy of Mr. François Jeanneret certificate:

Bern, 29. avril 2009

Your visit in the programme MedCliVAR (ESF reference no. 2173)

Dear Madam,

Based on a ESF Exchange Grant 2009 you spent six weeks mainly in our country, and we were happy to act as a host institution. I would like to confirm that from our point of view you had a very successful visit in Switzerland and neighbouring countries. I think you made the best of the 6 weeks you spent here, gathering information and presenting your own work.

Your visits included the following institutions:

19/02 Bellinzona Swiss Federal Research Institute WSL Sottostazione Sud delle Alpi

22/02-2/03 Bern Geography Institute, University of Berne, Research Group PHENOTOP Phenology – Topoclimatology – Landscape Geography; National Centre of Competence in Climate Research (NCCR) Oeschger Centre for Climate Change Research OCCR

02/03 Payerne Federal Office of Meteorology and Climatology, Aerological station

03/03-8/03 Zurich Federal Office of Meteorology and Climatology MeteoSwiss: ETH Zurich, Institute of Plant Sciences – Grassland Group

09-13/03 Geisenheim D Final Congress COST 725 "Establishing a European Phenological Data Platform for Climatological Applications" Offenbach D Phenological Network of the Deutscher Wetterdienst (DWD)

16/03 Birmensdorf Swiss Federal Research Institute WSL

16-25/03 Bern Geography Institute / University of Berne Geography Institute, University of Berne, Research Group KLIMET Climatology and Meteorology

27/03 Bologna I Università di Bologna BES - Dipartimento di Biologia Evoluzionistica Sperimentale.

In many of these institutions, you made a brilliant presentation of your research project in Tunisia. You also found very easily contact to the colleagues and were able to establish relations which

hopefully will be of a great use to your project and beyond, as it is linked to the hope that permanent phenological structures will be established in as many Mediterranean countries as possible, including your own one. We also hope that as a first step, the results in Tunisia will be linked to the ones in Italy and possibly Switzerland and other countries to form a cross section across the Mediterranean basin. We are certainly interested in a further cooperation.

We wish you a good continuation of your interesting and most rewarding phenological project.

With kind regards

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End of the report

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