



Exploratory Workshop Scheme

Scientific Review Group for Life, Earth and
Environmental Sciences

ESF Exploratory Workshop on

IMPACT OF NATURAL AND ANTHROPOGENIC PYROGENIC CARBON IN MEDITERRANEAN ECOSYSTEMS

Seville (Spain), 5-7 November 2013

Convened by:
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Co-sponsored by



Biocharisma project” (PCIG12-GA-2012-333784)



The European Science Foundation (ESF) was established in 1974 to provide a common platform for its Member Organisations to advance European research collaboration and explore new directions for research. Currently it is an independent organisation, owned by 67 Member Organisations, which are research funding organisations, research performing organisations and academies from 29 countries.

ESF is in a period of transition; the ESF Member Organisations (MO's) have indicated that they would like to wind down certain ESF activities, such as EUROCORES, RNP's, ECRP's and Forward Looks by the end of 2015, but ESF will continue to honour its existing commitments until the projects are finalised.

In 2013 the only research instrument that will have a call for proposals is the Exploratory Workshops. The focus of the Exploratory Workshops scheme is on workshops aiming to explore an emerging and/or innovative field of research or research infrastructure, also of interdisciplinary character. Workshops are expected to open up new directions in research or new domains. It is expected that a workshop shall conclude with plans for follow-up research activities and/or collaborative actions or other specific outputs at international level.

ESF is also currently exploring new areas where we could serve the science community. Services we have identified that would leverage our expertise and experience and provide added-value to the science community are: peer review, evaluation, research conferences and career tracking.

Please check our website (www.esf.org) for regular updates regarding ESF and its future developments.

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Summary and major objectives of the Workshop

In Mediterranean ecosystems, charred vegetation residues derived from incomplete combustions (natural wildfires and prescribed burning) play an important role. They contribute to the pyrogenic carbon (PyC) or as it is also referred to as “Black Carbon” pool of soils. In addition, during the last years, the fertilizing properties of charred plant residues were re-discovered and are nowadays divulged and encouraged within the concept of using biochars produced under controlled combustion conditions as soil amendment. The long-term impact of this practice as well as that of burning harvest residues on soil properties and on soil OM quality has not been well studied and therefore doubts persist.

Biochar effects on different ecosystems or in the food chain have been assessed poorly, particularly under different climatic conditions, soil types and land management systems. Therefore, a comprehensive framework for evaluating quality to the different biochars, prior to land application is required. This knowledge is strictly needed to avoid potential long term damage in the ecosystems.

This exploratory workshop will bring together leading researchers and experts to achieve a deeper knowledge of the following issues:

- The chemical composition, structure and properties of the different forms of PyC (including BC and biochar).
- Chemical and biological recalcitrance of PyC; Mechanisms of stability and functionality.
- Risks and benefits of biochar application to soil under Mediterranean climate conditions.



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Workshop Agenda

A key aspect of this workshop will be the production of a joint review manuscript which will comprise key questions of pyrogenic organic matter (PyOM) forms, including definitions, stability, benefits, potential risks and environmental impact in particular in Mediterranean regions. A major focus will be to extract common issues and differences in the area of research on natural PyOM and biochars and to elucidate what those two disciplines can learn from each other.

Delegates will be invited, in advance of the workshop, to provide commentaries and ideas to be included on the review manuscript. These commentaries completed a week before the workshop, will provide critiques in order to produce strengthened and a thorough review.

Taking into account that published research devoted to biochar, i) is almost exclusively focused on (sub) tropical regions, ii) published results cannot be generalized and (iii) European research is fragmented and uncoordinated so that many experiments are repeated while other urgently needed information is not yet available due to lack of (research) resources and coordination. The other main outcome of the workshop is the formation of a research network devoted to the study of effects of pyrogenic C in soil organic matter aiming to coordinate scientists with an European perspective and a global view.

Report publication and dissemination

The Book of Abstracts and the Workshop Report will be published as hard copy. In addition, is the intention of the convenors organising a joint review article of the major achievements of this exploratory workshop.



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PRELIMINARY PROGRAMME

Tuesday, 5th November 2013

Afternoon *Arrival, registration and welcome at Hotel Alcazar*
20.30 *Get-together. Dinner at Seville city center (Emporion Restaurant)*

Wednesday, 6th November 2013

9.00-9.10 **Opening by convenor**
José M. De la Rosa (IRNAS-CSIC, Seville, Spain)

9.10-9.20 **Welcome by CSIC representative**

9.20-9.40 **Presentation of the European Science Foundation (ESF)**
Nigel L. Brown (Scientific Review Group for Life, Earth and Environmental Sciences)

09.40-12.10 Session 1. Pyrogenic C: Distribution and stability

09.40-10.00 **Presentation 1 "Where does all the pyrogenic C go? Its redistribution in the environment"**
Stefan Doerr (Swansea University, Swansea, UK)

10.00-10.20 **Presentation 2 "Degradation versus stability: Understanding the source, fate and age of pyrogenic carbon in the environment"**
Philippa Ascough (University of Glasgow, East Kilbride, UK)

10.20-10.40 **Presentation 3 "Chemical, physical and biological stability of pyrogenic organic matter in soil"**
Cornelia Rumpel (CNRS-BIOEMCO, Thiverval-Grignon, France)

10.40-11.00 **Presentation 4 "Fate of biochar carbon from corn stover after 510 day-incubation in an andisol and alfisol"**
Peter Buurman (Wageningen University, Wageningen, The Netherlands)

11.00-11.20 *Coffee break*

11.20-11.40 **Presentation 5 "Observations on wildfire black carbon in shallow soils of the northern Alps"**
Oliver Sass (University of Graz, Graz, Austria)

11.40-12.00 **Presentation 6 "Chemical composition and biological stability of pyrogenic C from a natural fire"**
Marie Alexis (Biogéochimie et Ecologie des Milieux Continentaux, Paris, France)



12.00-13.00	Session 2. Characterisation of pyrogenic C forms
12.00-12.20	Presentation 1 "What is the differences between pyrogenic carbon of natural and artificial sources? A case study from a pine fores" Cristina Santín (College of Science-Swansea University, Swansea, UK)
12.20-12.40	Presentation 2 "PyOM characterisation in fire-prone Mediterranean pine forests" Giovanni Mastrodonato (Università degli Studi di Firenze, Firenze, Italy)
12.40-13.00	Presentation 3 "Biochar surface properties through application of an innovative NMR technique: Fast field cycling relaxometry" Pellegrino Conte (Università degli Studi di Palermo, Palermo, Italy)
13.00	Group-meeting photo
13.10-14.20	Lunch
14.20-16.10	Session 3. Effects of pyrogenic C on soil organic matter
14.20-14.40	Presentation 1 "Charcoal- a soil forming factor in frequently burnt soils" Heike Knicker (IRNAS-CSIC, Seville, Spain)
14.40-15.00	Presentation 2 "Wild-fire induced changes in the quantity and quality of organic matter associated to the mineral phase" María López (Instituto de Recursos Naturales y Agrobiología, Seville, Spain)
15.00-15.20	Presentation 3 "Can N-rich charcoal be used as an efficient N-fertilizer?" José M De la Rosa (IRNAS-CSIC, Seville, Spain)
15.20-15.40	Presentation 4 "The effect of heat in soil organic matter. Experience from controlled burning experiments of unaltered soil blocks" José A. González-Pérez (IRNAS-CSIC, Seville, Spain)
15.40-16.00	Session 4. Charcoal in arqueology
15.40-16.00	Presentation 1 "Charcoal in archaeological research-why preservation matters" Eileen Eckmeier (Aachen University, Aachen Germany)
16:00-17:00	Poster session & coffee break
17:00-19:00	Discussion from sessions 1-4
20.45-	Dinner



Thursday, 7th November 2013

09.00-09.10	<i>Opening and announcements by convenors</i>
09.10-10.50	Session 5. Biochar: Production and characteristics. Risks and benefits of its application to soils
09.10-09.30	Presentation 1 "Influencing biochar characteristics through pyrolysis conditions, feedstock blending and post-production treatment" Hans-Peter Schmidt (Delinat Institut, Arbaz, Switzerland)
09.30-09.50	Presentation 2 "The janus face of pyrogenic carbon regarding the distribution and availability of organic pollutants" Thomas Bucheli (Agroscope Reckenholz-Tänikon Res. Stat., Zürich Switzerland)
09.50-10.10	Presentation 3 "Potential and constraints of biochar for plant-available water supply" Bruno Glaser (MLU Halle-Wittenberg, Halle, Germany)
10.10-10.30	Presentation 4 "Biochar and soil hydrology under mediterranean conditions" Frank Verheijen (CEMAR, University of Aveiro, Aveiro, Portugal)
10.30-10.50	Presentation 5 "Optimised approaches for ecological risk assessment of biochar in soils" Ana C Bastos (CEMAR, University of Aveiro, Aveiro, Portugal)
10.50-11.10	<i>Coffee break</i>
11.10-14.15	Session 6. Discussion, consolidation and recommendations
11.10-12.00	Discussion from session 5
12.00-14.15	Identification of common issues, future steps, formulation of agenda for joint review manuscript and workshop report. Networking and closing remarks.
14.15	<i>Lunch at San Marcos Restaurant</i>
15.30	End of workshop and departure



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**Objectives of the ESF Science Review Group
for the Life, Earth and Environmental Sciences**

The main objectives of the **ESF Science Review Group for Life, Earth and Environmental Sciences** are:

1. to identify and promote emerging scientific topics and high quality science deserving special attention in Europe;
2. to manage a wide ranging portfolio of activities of the European Science Foundation;
3. to examine and report on issues of strategic scientific importance within its fields of competence.

This Science Review Group's sphere of activities comprises the broad field of life, earth and environmental sciences:

- Biology
- Biotechnology
- Agriculture
- Earth sciences
- Climate research
- Glaciology
- Oceanography
- Environmental sciences, etc.

ESF supports a limited number of **Exploratory Workshops** each year. These workshops allow leading European scientists to explore novel ideas at the European level with the challenging aim to "*spearhead*" new and preferably inter-disciplinary areas of research. Further details are available on the internet at <http://www.esf.org/workshops>.

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