ECOGENES FINAL REPORT

30/11/2013

EXECUTIVE SUMMARY

EcoGenes has reinforced the capabilities of the Doñana Biological Station of the Spanish National Research Council (EBD-CSIC) to perform a long-term working plan on the impact of global change on biodiversity in the Mediterranean area

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At a glance

PROJECT TITLE

EcoGenes: Adapting to Global Change in the Mediterranean Hotspot

PROJECT OBJECTIVE

Reinforce the capabilities of EBD-CSIC to face the challenges posed by the impact of global change in the Mediterranean region. Key objectives include: - upgrading of existing laboratories and creation of a new stable isotopes laboratory;
- recruitment of experienced researchers to increase the capacity for understanding the three focal areas (genetics, ecophysiology and ecological modeling);
-organization of conferences, secondments, training exchange activities, seminars, exhibition

PROJECT DURATION

3 years: 1 Dec 2010 – 30 Nov 2013

PROJECT FUNDING

2,761,415 €
SP4 CAPACITIES CSA-SA FP7REGPOT-2010-1

JUAN JOSÉ NEGRO

A Professor at the EBD-CSIC, he has published more than 140 articles in refereed SCI journals and participated in five FP7 projects. He is currently Director at the EBD-CSIC

CONTACT

Juan José Negro
Estacion Biologica de Doñana (EBD-CSIC)
Americo Vespucio s/n. Isla de la Cartuja. E-41092 Seville Spain

Global change is introducing threats to the preservation of natural resources. The impact of these menaces is difficult to measure; however, there is a general concern by citizenships demanding answers and actions from the governance. These actions require the inevitable incorporation of limits to the current pattern of development, which may be not always welcome by societal actors. It is therefore imperative to support with sound and reliable scientific criteria and data the difficult decisions that must be taken when incorporating the principles of sustainable development to the social and economic drivers that lead our society.

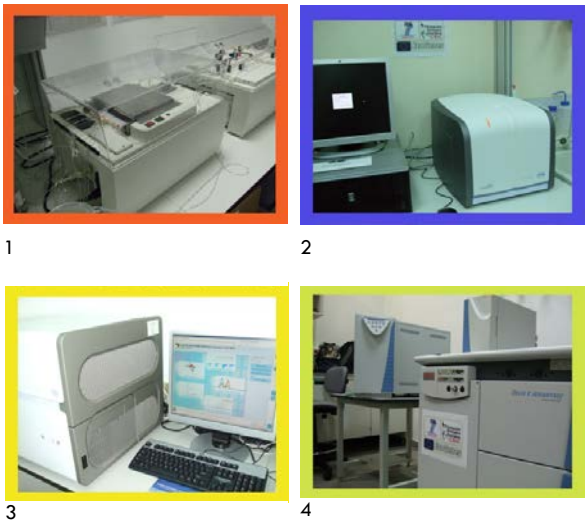
Doñana Biological Station (EBD-CSIC) is a public Research Institute belonging to the Spanish National Research Council (CSIC) in the area of Natural Resources. Its fundamental mission is to carry out multidisciplinary research of the highest standard directed to understanding, from an evolutionary viewpoint, the way in which biodiversity is generated, maintained, and how it deteriorates, as well as the consequences of its loss and the possibilities of its conservation and restoration. An inseparable derivative is also to promote the transfer of this knowledge to society.

People at EcoGenes. Professor Juan José Negro, coordinator of the project, sums up the overall scope of EcoGenes: "The objective of this project has been to reinforce the capacities of EBD-CSIC in order to maintain our ability to serve the Society of Knowledge by creating a cooperation platform where all similar institutions of Europe, and particularly those of the Mediterranean area, could exchange experiences, share standards and data, and promote training of experts to deal with the challenges posed by the impact of global change on the biodiversity and evolution of protected areas". He adds: "EcoGenes was an institutional project and naming all EBD people involved would fill these pages. Even though I would like to mention Jordi Figuerola, Carles Vilà, Manuela G. Forero, Jennifer Leonard, Xavi Picó, Eloy Revilla, José Antonio Godoy, and Jordi Bascompte for their specific implications as WP leaders and hosts for hired researchers, as well as Giulia Crema as my project assistant".

We selected analytical tools managed by all our research lines: Genomics, Ecological Modeling, and Ecophysiology. These new approaches were introduced in our running projects by eight researchers with expertise in these focal areas, whose incorporation enabled the creation of specific working groups in each area and the establishment of an open forum of discussion and debates involving researchers at EBD-CSIC. The loss of biodiversity due to global change, focused especially in the Mediterranean hotspot, was the common thread of the secondments activity involving our staff and staff from partnering organizations (Helmholtz Centre for Environmental Research, UFZ; Uppsala University; University of Groningen; French National Institute for Agricultural Research INRA), and the subject of training actions such as the Training in Ecological Modeling (April 2012), the Introduction to the Analysis of NGS Data (March 2013) or the Ecological Consequences of Climate Change course (September-October 2013). Threats posed by global change were also the driver behind the three international meetings funded by EcoGenes.

Participants at the final conference "Adapting to Global Change in the Mediterranean Hotspot" Seville 18-20 September 2013

To strengthen the current capabilities for analysis and interpretation of results of research, the upgrading of existing laboratories and the creation of a new stable isotopes laboratory at EBD-CSIC were essential steps. The newly created LIE-EBD (Stable isotope lab) has allowed incorporating isotopic approaches in EBD-CSIC research.



1 2 3 4

Acquired equipment. 1 AutoAnalyzer; 2 GS Junior Sequencing System; 3 Thermocycler; 4 Mass Spectrometer

The auto-analyser at the Aquatic Ecology Lab (LEA-EBD) has greatly expanded our ability to perform water quality analysis, which proves to be of special interest in the context of the Mediterranean Area, as quantity and quality of water are the main limiting factors in Mediterranean ecosystems. The excellent performance of the GS Junior sequencer has definitely expanded the analytical capabilities of the Laboratory of Molecular Ecology (LEM-EBD). In particular, GS Junior allows identifying large numbers of variable in non-model organisms, sequencing large numbers of targeted regions from many individuals at once, and sequencing whole genomes. Finally, EcoGenes has allowed the Ecophysiology laboratory LEF-EBD to incorporate the equipment and the implementation of techniques necessary for molecular and microbiological diagnostic of a wide range of pathogens and protein characterization, which implies the expansion of this laboratory into a bio-security level II section, suitable for working with agents of moderate potential hazards to personnel and the environment.

The results of the projects carried out at the EBD-CSIC are constantly transferred to society through seminars, press releases, and the EBD-CSIC and EcoGenes websites. However, the most important event in terms of disseminating the outcomes of studies has been the final photographic outdoor exhibition on global change that has been on display during the last month of September, and could be seen by thousands of people in one of the busiest pedestrian streets of Seville. The exhibition "*What next? Environmental Challenges in a Changing Planet*" consisted of 36 fixed panels through which visitors received concise but accurate and information on global change, evidences of which mainly come from studies carried out in our institute. This exhibition will tour several Spanish cities in the coming months.

One of the panel of the outdoor exhibition "What Next? Environmental Challenges in a Changing Planet". September 2013, Seville

EcoGenes in numbers. Within the framework of the project, 11 people got directly employed, a total of 28 scientific papers signed by 24 EBD-CSIC researchers were published, and 23 project proposals featured by hired researchers were presented. We hosted 101 researchers for short stays, conferences, lecturers and meetings. Nineteen seminars framed within the three focal areas were conducted, gathering 575 students and researchers. A total of 52 people, in majority EBD-CSIC personnel, assisted to the specific training courses, while 482 registered at the 3 international EcoGenes conferences. Seventy-two press releases about scientific production of EBD-CSIC researchers were prepared, and 1,596 press citations were recorded.

The structure of EcoGenes will propel EBD-CSIC research well into the future. The international projection and collaborative approach of EBD-CSIC research staff will guarantee the continuity of the actions proposed beyond the duration of EcoGenes.