Project PEA (Photosynthesis and Earth Atmospheres): Investigating the effect of evolutionary adaptation to high atmospheric carbon dioxide concentrations in fossil and living plants

Fact Sheet

Project Information

Project PEA

Grant agreement ID: 275626

Project closed

Start date
1 June 2011

End date
31 May 2013

Funded under
Specific programme "People" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Total cost
€ 181 084,00

EU contribution
€ 181 084,00

Coordinated by
CONSIGLIO NAZIONALE DELLE RICERCHE
Italy

Objective

Photosynthesis is of critical importance to biodiversity, food security and society within the context of current climate change. The photosynthetic responses of plants to rising atmospheric CO2 have been studied in experiments where CO2 is artificially enriched to predicted levels. However, these experiments involve plants adapted to current “low” ambient levels of ~380ppm CO2, and do not incorporate consideration of plant evolutionary adaptation of photosynthesis, where the physiology of plants adjust to long-term incremental CO2 rises. Plants growing around volcanic CO2 degassing vents possess an evolutionary adaptation to “high” atmospheric CO2 and display markedly different responses than plants adapted to lower ambient CO2. Plants adapted to “high” CO2 exhibit pronounced photosynthetic rates, no down-regulation of photosynthetic physiology and maintenance of transpiration rates – all important parameters for coupled atmosphere-biosphere models of climate, vegetation and carbon sequestration responses to aid management and mitigation of future climate change. These evolutionary responses to CO2 are also present in the plant fossil record over timescales of millions of years. The stomata of fossil plants are used to reconstruct past atmospheric levels of CO2 in the study of previous global-warming events that provide important climate/biodiversity indicators for the current global-warming crisis. The use of living plants adapted to both “high” and “low” atmospheric CO2, in comparative physiology/morphology studies under elevated CO2, will provide much needed data on likely plant responses to rising CO2 and those of plant fossils through earth history. This will place Europe at the forefront of plant evolution and palaeoclimatic research; linking two European research institutions (IBIMET, Italy and UCD, Ireland) in the European Research Area to create a platform for European Research Excellence and competitiveness.

Fields of science (EuroSciVoc)

medical and health sciences > health sciences > **nutrition**

natural sciences > biological sciences > ecology > **ecosystems**

medical and health sciences > basic medicine > **physiology**

natural sciences > earth and related environmental sciences > atmospheric sciences > climatology > **climatic changes**

natural sciences > biological sciences > **botany**

Programme(s)

FP7-PEOPLE - Specific programme "People" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Topic(s)

FP7-PEOPLE-2010-IEF - Marie-Curie Action: "Intra-European fellowships for career development"

Call for proposal

FP7-PEOPLE-2010-IEF
See other projects for this call

Funding Scheme

MC-IEF - Intra-European Fellowships (IEF)

Coordinator

CONSIGLIO NAZIONALE DELLE RICERCHE

EU contribution

€ 181 084,00

Total cost

No data

Address

PIAZZALE ALDO MORO 7
00185 Roma
Italy

Region

Centro (IT) > Lazio > Roma

Activity type

Research Organisations

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Last update: 25 May 2022

Permalink: https://cordis.europa.eu/project/id/275626