



H.F.R.I.
Hellenic Foundation for
Research & Innovation

Description of the funded research project
1st Call for H.F.R.I. Research Projects to Support Faculty
Members & Researchers and Procure High-Value
Research Equipment

Title of the research project:

**Quaternary Environmental Changes in the Corinth Rift Area:
the IODP 381 palaeovegetation record**

Principal Investigator:

Katerina Kouli

Reader-friendly title:

QECCoRA

Scientific Area:

Natural Sciences

Host Institution:

National & Kapodistrian University of Athens

Collaborating Institutions:

**University of Cologne, Germany,
University of Southampton, United Kingdom,
Columbia University, USA**

Project webpage: <http://qeccora-en.geol.uoa.gr>



Budget: 173,000 €

Duration: 36 months

Research Project Synopsis

The “Quaternary Environmental Changes in the Corinth Rift Area: the IODP 381 palaeovegetation record (QECCoRA)” research project, aims to investigate how climate variability affected the development of regional vegetation and the marine ecosystems. The sedimentary record from the Gulf of Corinth is the first long palaeoenvironmental archive retrieved from the southern Balkans and provides a unique opportunity for regional palaeoenvironments and paleoclimatic studies. By applying palynological methodologies, we plan to examine how plant ecosystems in the borderlands of the Gulf of Corinth responded to the Quaternary glacial-interglacial cycles. Furthermore, the diversity of the regional flora during the Pleistocene, the timing of the extinction of Tertiary relict taxa and the evolution of depositional palaeoenvironments in the Gulf of Corinth are some of the main scientific questions to be addressed.

Project originality

Palynological analysis constitutes a crucial element of the IODP Exp. 381 research plan. The QECCoRa project contributes to the IODP Exp. 381 scientific objectives, directly linked with some of the major challenges described in IODP Science Plan included in the themes of Climate Change, Biosphere and Geohazards. Based on the collaborations within the research team of the IODP Exp. 381, the palynological analysis is extremely important, as it will considerably contribute to the resolution of the dynamic correlation between vegetation and climate at southeastern Europe during the Quaternary. Furthermore, the phytoplankton palynomorph signal will add to deciphering depositional environment alternations in relation to the eustatic sea level changes and active tectonics. The Corinth Gulf sediment cores can provide a unique and detailed record of the way tectonics, climate and palaeoenvironment have impacted the syn-rift deposition.

Pollen, dinoflagellates cysts and green algae remains constitute the only biotic proxy that is encountered in every kind of depositional environment and preserved throughout the entire geological record allowing a direct land-sea correlation. Therefore palynology is of inevitable significance for the characterisation of the alternating depositional environments and can serve as a base for the correlation of all discontinuous proxies to be analysed within the IODP Exp. 381 Science Party. Least but no last, the palaeovegetation diagram that will be produced has the potential to become the reference for future Quaternary palaeoenvironmental research in southern Greece and provide a detailed biostratigraphic scheme for the correlations of the fragmented terrestrial archives.

Expected results & Research Project Impact

The QECCoRA project aims to assess the impact of processes controlling the terrestrial realm and link them with changes observed in the depositional environment and climate-driven sea level changes.

The pollen archive produced will record the succession of vegetation on the borderlands of the Corinth Gulf through successive glacial-interglacial cycles over the last ~1Ma. This new, millennial-scale vegetation record, will constrain the timing of extinction of relict tree taxa from the north-eastern Mediterranean region, identify possible tree refugial areas in Southern Greece and provide a detailed biostratigraphic scheme.

An innovative laboratory methodology will be derived in order to maximise the palynomorph concentration in horizons of high sedimentation rate. The new methodology will be further tested in future laboratory investigations aiming to accelerate the subsequent microscopic analysis.

A major challenge is the development and validation of novel palynomorph-based indices to evaluate fluctuations in the terrestrial runoff. Palynomorphs are among the few proxies that allow direct insights into how terrestrial processes control sediment accumulation in the Corinth basin. The assessment of the impact of processes controlling the terrestrial realm and their link with changes observed in the depositional environment, as well as climate-driven sea level changes is another of the expected results.

The QECCoRA project is a unique opportunity for Greece affiliated scientists, especially young researchers such as PhD students, to participate in a great international scientific collaboration under the auspices of the International Ocean Discovery Program (IODP) and the European Consortium for Ocean Research Drilling (ECORD). This environment attests the high quality and impact of produced scientific results, increasing the visibility of the research produced in our country in well-established international consortia. Finally the scientific results will be communicated to the public worldwide through the existing well-established dissemination channels of the IODP and ECORD outreach office.

The importance of this funding

The funding of the QECCoRA project by H.F.R.I. is crucial in order to maintain the international scientific collaboration and achieve the obligations to perform post-cruise research coming of the participation of the PI in the IODP Exp. 381 research team. As Greece is not a member of ECORD, the Greece-affiliated researchers cannot participate in an IODP Scientific Expedition or claim IODP funding for their thematically related research. The IODP Exp. 381, a scientific expedition targeting sites in Greek territory, is the first IODP expedition in which Greece-affiliated scientists are called to participate. This unique opportunity is a result of the participation of Greek scientists, since the conception, submission and funding of the Corinth Rift Drilling proposal.



H.F.R.I.
Hellenic Foundation for
Research & Innovation

COMMUNICATION

185 Syggrou Ave. & 2 Sardeon St. 2
171 21, N. Smyrni, Greece
+30 210 64 12 410, 420
communication@elidek.gr
www.elidek.gr