

# Euoplanet TNA Report

## PROJECT LEADER

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<b>Date of TNA visit:</b>	November 10-20, 2010
<b>Host laboratory:</b>	TNA1 (Planetary Field Analogues: the selected field sites provide the most realistic analogues of Mars, Europa and Titan), Ibn Battuta Centre provided by International Research School of Planetary Sciences, Università d'Annunzio, Italy. Scientific Contact – Prof Dr Gian Gabriele Ori, International Research School of Planetary Sciences, Università d'Annunzio, Pescara Italy.

## PROJECT TITLE

**MOROCCAN MUD MOUND FIELD: an UNIQUE TERRESTRIAL ENVIRONMENT as a NEW EXPLORATION TARGET on MARS and CLUES to PRESENCE of FOSSIL/LIVING MICROORGANISMS on MARS ..**

## REPORT ON THE OUTCOMES OF THE TNA VISIT (approx 1 page)

The Moroccan Hamar Laghdad mound field is one of the most ancient (Devonian, ~400 Myr) and well preserved, subaerially exposed terrestrial field of carbonate mud mounds. The mounds features are comparable to those on Mars and can provide a useful reference for interpreting the results of Mars-orbiting spacecraft exploring the Martian surface.

The mission objectives were:

- a) to collect new field data over respectively Hollard and Kess Kess mounds.
- b) to study the potential for Mars analogue geological and exobiological applications.
- c) to collect and study samples for characterizing the paleontology, geobiology and palaeoenvironments of the Devonian mounds and surrounding facies.

In order to achieve these objectives our field work from 10 to 20 November 2010, building upon previous field, lab and analogue mapping experience consisted of:

- a) reconnaissance observations and mapping of the overall Hamar Laghdad ridge and associated mounds, with particular attention to the Hollard Mound.
- b) field data collection, including photographic and geolocation information for selected mounds, outcrops and facies within those outcrops.
- c) sample collection for further analyses.
- d) observation and mapping of medium to large-scale landforms for comparison with Mars counterparts as imaged by high-resolution orbiting cameras.

The results of the performed field campaign include:

- a) a better understanding of the geology of selected portions of the Kess Kess mound field
- b) improved and new sampling of facies with geological, geobiological and exobiological relevance.

Some of the samples collected during the campaign are being analyzed through services and facilities of the FP6 ANNA (European Integrated Activity of Excellence and Networking for Nano and Micro-Electronics Analysis), proposal ANNA\_TA\_UC9\_RP005 (to BC).

Deliverable to the community will include scientific publications and specialized or public talks, presentations and seminars, targeting both the research and the education audience.

We plan to continue the study and laboratory analysis of collected samples during this campaign in the remaining part of 2010 and 2011. Moreover we do plan to perform further remote sensing and field-based work in 2011, possibly applying for the use of the Ibn Battuta EuroPlanet TNA1 facility.

## **PUBLICATIONS ARISING/PLANNED (include conference abstracts etc)**

### **Publications**

- Cavalazzi B, Barbieri R, Cady SL, George AD, Gennaro S, Westall F, Lui A, Rossi AP, IN PREPARATION. Iron-rich framboids from a hydrocarbon-related Devonian mound (Anti-Atlas, Morocco): fossil or pseudofossils of fossil bacterial colonies? *Sedimentary Geology*.

### **Conference abstracts**

- Cavalazzi B, Barbieri R, Franchi F, Ori GG, Rossi AP, Westall F, 2011. Seafloor seepages, methane-related carbonate fabrics and clues for the search for cold seep and gas hydrate systems in the geological record: examples from North Africa. 23rd Colloquium of African Geology, University of Johannesburg, January 8-14<sup>th</sup> 2011. Oral presentation.

- Franchi F, Barbieri R, Cavalazzi B, 2011. Evidences of hydrothermal activity in the Kess Kess carbonate mounds, Morocco. 23rd Colloquium of African Geology, University of Johannesburg, January 8-14<sup>th</sup> 2011. Poster presentation.

## **HOST APPROVAL The host is required to approve the report agreeing it is an accurate account of the research performed.**

The present report provides a clear and rigorous assessment of the activity performed under the Europlanet TNA1 programme. The activities planned to complete the research commitment are in line with the project objectives.

Prof. Gian Gabriele Ori  
 Director IRSPS and TN1 unit responsible