



Institut de Paleontologia M. Crusafont

Escola Industrial, 23. 08201 Sabadell
Tel. 937 261 769. Fax 937 276 641
m.sabadell.pa@diba.es www.diba.es

Àrea de Cultura
Oficina de Patrimoni Cultural

Sabadell 16/11/04

Dear Volunteers of Early Man in Spain,

Thank you very much for your support during last field season. As you know, we found some administrative difficulties last summer, which did not permit us to do a regular excavation in Orce.

We looked for the best alternative plan that we could arrange, since did not want not to disappoint you, and use the human potential - you - to develop our research. We organized an excavation in Cueva Victoria, the permit was granted to us by the regional government of Murcia within 24 hours!

We found good accommodations near the site and we produced a great collection of fossils (>1000), some of them are now under study.

On the other hand we sieved sediments in Orce, this work concentrated the small fossils in the sediment, which you later separated in the cave. This produced a nice collection of micromammal bones and teeth, which is now being studied.

Some volunteers did additional work like surveys with the objective of identifying new interesting sites and sample collections for paleomagnetic studies.

We can say that the whole expedition was good, thanks to your flexibility. We changed the original plan that we had, we produced new data and we moved another step forward in the way of knowledge.

We are now working on scientific papers and also explaining to the regional authorities what we did, convincing them about the necessity of the progress of this project.

In this sense your contribution was also great: some veteran volunteers sent letters to the newspapers in Granada, others were interviewed in Orce and one of you explained his experience in his TV program.

I'm sure that all these efforts will not be in vain, and they will help to have a great field season in 2005.

For now all this work sure did contribute to the decision of the Government of Catalonia, which awarded Josep in December 04 with the Gold Medal for Scientific Merit, and this medal is shared with you as all of you deserve a piece of it.

Thanks again for your support,
Josep & Lluís

EARLY MAN IN SPAIN 2004
Final report

PRINCIPAL INVESTIGATORS:

Josep Gibert Cloles & Lluís Gibert Beotas

POSITION/AFFILIATION:

J.Gibert: Instituto de Paleontología "Dr. M. Crusafont"

Ll.Gibert: Universitat Politècnica de Catalunya

MAILING ADDRESS:

Institut de Paleontologia "Dr. M. Crusafont",
Escola Industrial 23
08201, Sabadell, Spain

RESEARCH SITE:

Orce and Cueva Victoria, SE Spain

TEAM DATES IN FIELD:

Team I: July 13 - 26, 2004

Team II: July 29 - August 11, 2004

Team III: August 14 - 27, 2004

Team IV: August 30 – September 12, 2004

Team V: September 14, September 27, 2004

TEAM SIZE: Minimum: 7 Maximum: 15

HIGHLIGHTS

The Orce region (Cullar, Benamaurel, Galera, Orce and Huescar) extends over 600 square km and is situated in the northeast area of the Baza basin in SE Spain. Different archaeological and palaeontological sites of the Plio-Pleistocene period occur in that area. The Baza basin was occupied by a large lake during the Pliocene and Pleistocene, this lake leave a continuous sedimentary record longer than 4 millions of years. On the shores of the lake is where archaeological and palaeontological sites where formed. At present the erosion has produce deep ravines which allows us to explore these old lacustrine sediments and locate new sites. The history of the four million years is written in these beds, which contains remains of all kind of fossils (plants, bones, etc). About sixty sites have been located up to now, six with lithic artifacts and two with human remains. However, only four sites have been systematically excavated. The potential of these sites are immense and comparable with Olduvai gorge in Tanzania (as has remarked more that one researcher Zilman et al, 1996, *Current Anthropology*). The presence of human activity in a very old time makes this region more interesting, special because is not a unique site, there are different archaeological sites in superposed layers which indicates that people were there for a long time. With the present palaeontological and geophysical data we can said that those human remains and artifacts are the oldest evidence of human presence in Western Europe (about 1.5 myo). Our goals in this project are to continue the investigations on these old deposits, making excavations and continue the exploration of the area. These will supply more archaeological, palaeontological and geological data, which will permit us to understand better when the people arrive to Europe, which way they use, in which kind of environment they live and for how long they live there. The work done this year in Cueva Victoria site complements the research in Orce from the paleontological and geological view.

SUMMARY THE SEASON'S HIGHLIGHTS

Last summer different task were achieved in Early man in Spain.

We excavate Cueva Victoria site for a week with each of the teams. The work in Cueva Victoria is not as easy as you could see last summer: the cave is huge and became a mine early in the 20th century; this provokes a lot of alterations in the original cavity, generating new galleries. The work in the cave consists basically in digging and collecting sediment, which is in the floor. The most rich areas with bones are in the ceiling of the cavity, but this is for now inaccessible. Some big blocks full of fossils and moved by the miner activity are near the floor but those are too cemented to be dig, so we decided to left that for the future when we have better tools. We collected and sieve tons of sediment in Cueva Victoria, this work has produced the biggest collection of fossils in a single field season, with more than 1000 bones of more than 35 species. Some of these bones are difficult to classify and part of this material is under study.

Micromammal research: in addition the excavation in Venta Micena, we collected sediments from different fossiliferous beds and we sieve the sediment in the river. Later, in the cave, pick up the remains of small mammals. This is a kind of work, which is necessary due the importance of micro-mammals in continental biostratigraphy. We have now a large collection of small tooth of mammals that is being studied by Dr. Bob Martin (Murray university). This study is supplying more accuracy in the ages of the sites, and will permit to improve the biostratigraphy of the Pleistocene deposits in Europe.

In addition of biostratigraphic studies with fauna, we worked with Dr. Scott, doing different paleomagnetic sections. That will improve the knowledge about the age of the sites and the whole sediments in the region. We have been working in that during the last six years; but last summer, thanks to the help of volunteers, we collected a large collection of samples, part of them are already analyzed and have very interesting answers. The first result has already been accepted for publication in the prestigious journal *Quaternary Science Review*.

This year we start an isotopic study of the C and O isotopes from fossil soils, in collaboration with Dr. David Fox (Univ. Minnesota), we hope to have soon interesting results about the climatic evolution in the area during the Quaternary.

We train the volunteers in prehistory, paleontology, geology and human evolution by doing different talks and excursions to archaeological sites.

We consider the field season 2004 was successful, and we want to headline that this was possible due to general the flexibility of the volunteers who accepted the new plan and worked with enthusiasm.

OBJECTIVES

The Early Man project is a long-term project that works in a large area in SE Spain, with a great archaeological, palaeontological, and geological information. We are interested in the period of time between 2 and 0.5 million years. We want to know more about what happened during this time in South Europe especially the any implication with early humans. The objectives of this research project will be reached not in one only field season. The data we collect each summer are a new piece on this large puzzle. The objectives of our project are:

First Human Occupation

The age of the first human occupation in Europe has been the object of a lot of debate in recent years and this has great relevancy in being able to establish the hypothesis about the dispersion of Homo out of Africa. One of the objectives on this project is to

find a more accurate age for the different archaeological sites. For that objective we are working with one of the best lab, Berkeley Geochronology Center, (Dr. Gary Scott).

Migratory Routes

Migratory routes, especially the crossing of the Strait of Gibraltar, have been the object of our studies and we are looking for more objective data in support of this theory, as the identification of more African mammal species in the sites.

Systematic Position of the First Europeans

Systematically characterizing the human remains found in south Europe is of great importance within Human Paleontology. In Africa at about 1.5 mya three different species live simultaneously *H. erectus*, *H. Ergaster*, *H. habilis*.

In Eurasia, the old finds from Dmanisi (Georgia) has been classified as *Homo ergaster*. Human fossil material is for now scarce in Orce but future excavations will supply new remains that, will contribute to classify this human remains.

Long Occupation In Europe

As we have said before, the sedimentary sequence of the Orce region with different superposed archaeological sites, allows us to determine if a continued occupation of Europe existed since the early Pleistocene period. During the actual state of the investigation, we can confirm the existence of Olduvai artifacts from the Barranco Leon (1.5 mya), Fuentenueva 3 (1.2 mya) and the presence of bifaces in other sites of undermined age in which systematic excavations still have to be carried out.

This allows us to form a hypothesis of the long and continued occupation of *Homo* in Europe.

Climatic Changes

It is possible to detect climatic changes in the region during the Quaternary by applying sedimentological criteria as in the existence of sedimentary cycles (Gibert, L. et al. 1998), fauna criteria related to fauna outbreaks and analysis of isotopes and pollen. Until last summer we only had applied sedimentological and fauna criteria, which demonstrate the existence of five major climatic changes in the sedimentary history of the basin. This year we start an isotopic study of the C and O isotopes from fossil soils in collaboration with Dr. David Fox (Univ. Minnesota), we hope to have soon interesting results, which indicate minor scale climatic shifts in the scale of 20-100 kyears. We hope that this kind of geological research will permit to relate local climatic events with the established global climatic events. This also would permit to place the different sites in different climatic contexts.

Increase the collection of fossil mammals

Each excavation increases the collection of fossils mammals, all this material is stored in a museum, and it is a permanent reference for new studies about the sites. We can say that: as larger is the fossils collection, more information we have about the sites. In fact, the paleontological finds (macro and micro-mammals) from Orce sites are becoming a reference for regional palaeontological studies in Europe. The museum and the collections of fossils in Orce are visited every year from tourist and experts from around the world. The same happens with the fossils from Cueva Victoria, which are stored in the archaeological museum of Cartagena.

Models of Human Occupation

We have detected antropic action in some sites, and we want to know if this was opportunistic (use the dead animals for feeding in the same place), or if there are transport the food to a save place. The most interesting place for study the antropic action is Venta Micena, at this site we can record with precision the antropic action by means of the presence of broken bones due to blows, cut-marks and manuports (Gibert, J. et al, 1992; Jimenez et al, 1992; Gibert et al 1989). What is interesting is that this human activity is compatible with activities of hyenas and other carnivores in the same place. Investigating this compatibility is of great interest in understanding the behavior of our ancestors from these ages. In Cueva Victoria, the human bones where transported in to the cave by means of hyenas, the cave was used as an hyena den and the big Hyenas transport food from outside to feed their babies. This is indicated by the large presence of hyena coprolites and teeth marks in the bones. Also the presence of seal bones and other sea mammals inside the cave can only be explained as a consequence of human or hyena transport, hyena teeth marks on these bones indicate that were hyenas. The absence of lithic tools is also an indication the humans did not live inside this cave.

SPECIFIC OBJECTIVES OF THIS FIELD SEASON

The specific objectives of this field season was in origin to dig in one of the Orce sites, this was not possible at the end due to administrative impediments. We arranged and alternative plan with different objectives but of high interest for us. We dig in Cueva Victoria site, which is a site where we have been working with small groups for the last 15 years. The site is about 1.2 million years old and has human remains and some African mammal species, which indicates a migration across Gibraltar. We collected lot of fossil material, which is under study, no complete human bones were recovered but we have some fragments that are now been analyzed. Other exciting find was the bones of a huge bird, we consider the possibility the those remains belonged to and ostrich which have African origin, but we think now that the size is too not big enough for be classified as an ostrich.

Another important contribution of last field season is the large collection of micro-mammals we made from different sites in the Orce area. We have the presence with us of one of the best experts in fossil micro-mammals during team 5 (Dr. B. Martin), he excited a lot the team and convince everybody with his talks that this is an essential line of research in the project. We collected a great collection of micro-mammal teeth, the largest we never collected in a single field season!

The paleomagnetic research is also going well, samples collected with the help of volunteers are really interesting and will clarify the age of the deposits. Part of the results will be published soon in *Quaternary Science Review* and we are preparing a second paper for another important scientific journal.

METHODS

To accomplish the proposed objectives, we used the normal methods of different scientific disciplines.

Excavations

The excavation in Cueva Victoria is different to an excavation in the Orce sites, the main difference is that the Orce sites are formed in the shore of lake beds, are very continuous deposits in the space where it is easy to open a quarry. Cueva Victoria is a Cave filled with sediments, part of these sediments were removed by miner activity, this means part of the fossils were destroyed. The miners generated a new stage in the cave with big blocks with fossils were removed from their original position and are now in the cave floor. The ceiling and the walls of the cave are rich in fossils but it is difficult to access to these areas. We think that before that we need to clean and sieve everything removed from the original position and now placed in the floor. So we didn't arrange any meter square, because we know that everything we collected has been moved. We just dig and collected the sediment to be sieved later, separating all fossils.

The natural objects extracted were cleaned and restored in the house and numbered. In a second stage we will proceed to a premier classification to evaluate their importance. The job of cleaning, restoring and classifying will be done in collaboration with the excavators

Micromammal sampling:

This work was done in Orce. We collect from the field, bags of sediment from those layers that we considered interesting. We transport this sediment to the river and we sieve it using a water pump. With that system we eliminate all the clay fraction of the sediment and only fossils remain and small grains of rocks remain. Once in our house-cave we separate those fossil remains from the sediment.

Paleomagnetic sampling

Paleomagnetic studies is at present one of the priorities in this research, we start this studies five years ago with Dr. Gary Scott from Berkeley Geochronology Center. We have a lot of new information from this lasts years. What we done last summer was to infill the gaps we had from particular sections. Samples must be collected under the surface in an area not affected by weathering processes. The volunteers help to dig and reach the fresh sediments not affected by weathering processes. Gary show them also how to collect these samples, which need to have at least one flat face oriented with a compass.

Scientific Discipline

The proper method of scientific discipline will be used for the study of geology, sedimentology, paleomagnetism, archeology, paleontology, paleoanthropology, and other scientific areas.

VOLUNTEER TASKS AND ACCOMPLISHMENTS

- a) Last field season we work in Orce and Cueva Victoria (about one week in each site) with five teams of volunteers, all of them done an excellent work and give us necessary the help we need to advance in our research project. We excavated in different sites increasing the collections of fossils and the paleontological information for that region. We sieved sediment collecting micromammals, which will permit to improve the biostratigraphy of the basing, making a reference for other basins. We collected samples for paleomagnetic studies. The volunteers made a hard work helping us to dig the necessary holes in the ground for collect these samples. We done different surveys around the region with the objective to identify other interesting paleontological or archaeological sites.
- b) The work of volunteers this summer can be summarized as:

We excavated at the site of Cueva Victoria, digging and sieving the deposits of this Cave.

Volunteers helps in the whole process of the excavations, collecting, cleaning and restoring them.

In Orce, we wash with water in the river different types of sediments, with the objective of collect a collection of micromammals tooth. We also collect a collection of samples for be used in paleomagnetic studies in Berkeley Geochronology Center.

- c) The work with Earthwatch volunteers was fine, everybody learn easily their own task, it was no necessary to do any changes in our research methods apart of the methodological implications derived from the change of did in Orce quarries to a Cueva Victoria.

RESULTS

As we said before, the results of last season can be summarized in that:

-We collected more than 1000 bones and tooth of big and small mammals which can be classified because they are complete or preserve diagnostic anatomical areas. This permits to increase the collection of fossils from Cueva Victoria. We also finds thousands of small fragments of bones that can not be classified but can preserve interesting features as for example carnivore tooth marks or human cut marks.

-Collection of more than 200 tooth of micro-mammals, which are at present under study, but can represent between 5 and 10 spices of micro-mammals.

-During this field season Dr. Gary Scott was working together with us collecting samples for geochronological studies. This study is working fine and the results are great.

DISCUSSION

As we said before, Early Man in Spain project is working in a large area in SE Spain, with a great archaeological, palaeontological, and geological information, for the late Pliocene and all Quaternary. This is the reason that some of the objectives of this research project will be reached not in one only field season. The finds of each field season, are a new piece on these large puzzle, those from last summer give us new information that will determine the direction of future excavations in the area.

PUBLICATIONS

TV

Two crew of TV was in the field last summer for a week, one of them was from Barcelona TV, it was and interview of 30minutes to Josep and Luis for the scientific program called "Einstein in the beach". Lot of people see this program which was passed two times.

Other TV crew was with us for here days a with team two. They belongs to and independent company and are doing a one hour documental about the history of this

project, their objective is to pass it in movie-theatre and TV. They interview the staff on the field, and have continued recording in the Paleontological Institute and important events as the presentation of Josep books and will be for the ceremony of the Josep award next month.

Recen Publications:

Gibert Josep, Ribot Francesc, Lluís gibert, Ferrández Carlos, Sánchez Florentina, Gibert Patxu. (2002) Early Pleistocene human remains from Orce (SE Spain). Congreso de la sociedad de antropología biológica, UAB 2001. Congress book.

Gibert, Florentina Sánchez, Francesc Ribot, Lluís Gibert, Carlos Ferrández, Alfredo Iglesias, Patxu Gibert & Fernando González. (2002) Restes humaines dans les sédiments du Pleistocène inferior de la region d'Orce et de Cueva Victoria (au sud-est de l'Espagne). *L'Antropologie*. 106: 669-683.

J.Gibert, L.Gibert, C.Ferrandez-Canyadell, A.Iglesias, F.González (2003). Venta Micena, Barranco León-5 and Fuentenueva-3: tree archaeological sites in the early Pleistocene deposits of Orce, South-East Spain. A very remote period indeed. Ed Enciclopedia of Human Evolution. Princenton Hill.

L. Gibert , G. Scott, C. Ferrández-Cañadell. (**in press**). Evaluation of the olduvai sub-chron in the Orce ravine (se Spain). implications for Plio-Pleistocene mammal biostratigraphy and the age of Orce archaeological sites. *Quaternary Science Reviews*.

Gibert L., Sanz de Galdeano, C, Alfaro P., Scott G., López Garrido A. (**submitted**). "Fossil" landslides interpreted as seismites in Quaternary lacustrine deposits from the Baza basin (SE Spain). *Sedimentary Geology*

G. Scott, L. Gibert , J. Gibert (**submitted**). Magnetostratigraphy of Venta Micena, Spain: a continental Plio-Pleistocene boundary and the dispersal of African fauna with early humans. *Nature*.

OTHER ACCOMPLISHMENTS AND BENEFITS

With the development of this project, the implicated sciences will be the first to be benefited. The first objective of this project is centered on the characterization of the first Hominids in Europe, their activity and description of their surroundings, thus trying to understand their African migration. Human paleontology, archeology and in general geology of the Quaternary will be the most favored sciences. If we succeed in finding significant human remains we could make a significant step in human paleontology and perhaps change some concepts about the evolution and formation of Homo.

It also favors the conservation of fossil remains and lithic artifacts from the region and preserves them from destruction. All these find permits the creation of a museum in the small town of Orce in 1986, since that year all the finds we collect are stored this museum of Paleontology and Prehistory. The conservation of the heritage of Orce through excavations will bring many benefits from this project.

The benefits for the educational community would be derived from the investigation that brings new data, which would be added to the teaching process but also produce an exchange between the excavators and other countries. The periodic teachings by the team investigator will also be beneficial to the excavators and the invited scientists.

For local businesses the benefits are considerable. The excavators who stay in Orce will bring in money to the businesses. In economically poor areas the presence of international groups of investigators and excavators is very stimulating and contributes to consolidating economic projects for future security.

Public Policy

This project will contribute to the development of the region especially through cultural tourism, which it will generate. The Prehistoric and palaeontological Museum is actually visited by 10,000 visitors per year. If through this project, new data are found then visits will increase.

In general, the region can be revitalized with an international project through investigations which generate news around the world.

We have been able to detect that visitors to Orce are motivated by the excavations and are impressed by the great landscape which contains other tourist values such as house-caves, natural swimming pools and a desert. Many scientists, who attended the International palaeontological Congress that was held in Orce in September 1995, asked if a new congress could be organized here. They gratefully remembered the lodgings, food, landscape, convenience etc. besides all the scientific contents.

ACKNOWLEDGEMENTS

Staff and visiting scientifics during last field season:

J.Gibert, Inst. Paleontologia Crusafont
 Ll.Gibert, Inst. Paleontologia Crusafont, Universitat Politecnica de Catalunya
 O.Vicente, Universitat Autonoma de Barcelona
 C.Ferrnandez, Universitat de Barcelona
 G.Scott, Berkeley Geochronology Center
 Robert A.Martin, Murray Stat University
 Samuel
 F.Sánchez, Inst. Paleontologia
 F.Ribot, Inst. Paleontología
 A. Iglesias, Universidad de Santiago de Compostela
 M. Lería, Sevilla
 Jordi, Barcelona
 Vangelis, Barcelona

List of Cooperating institutions

- Inst. Paleontologia "M.Crusafont"
- Universitat Autonoma de Barcelona
- Universitat de Barcelona

Last field season we didn't receive any additional funds, so Early Man in Spain is at present 100% founded by Earthwatch Institute.

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