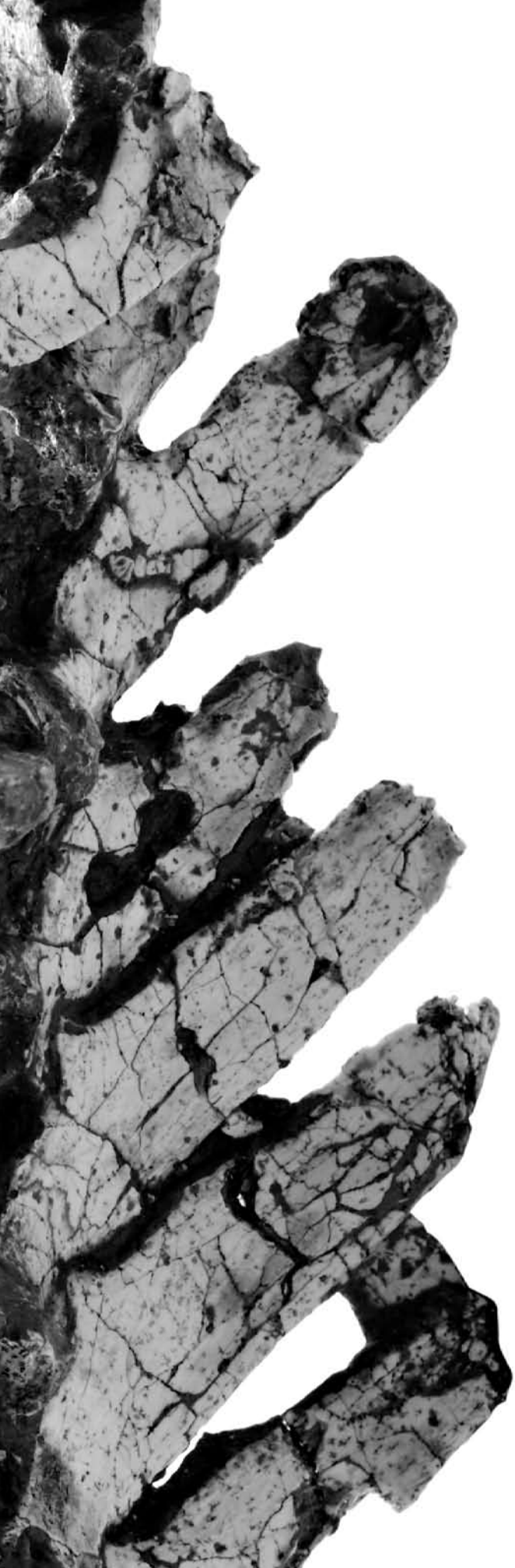
# ANNUAL REPORT Institut Català de Paleontologia

2009

Centres de recerca de Catalunya



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# 1 WELCOME to the ICP

The Institut Català de Paleontologia (ICP) is a private foundation created in November 1969, sponsored by the Generalitat de Catalunya and the Universitat Autònoma de Barcelona. The ICP took over the Institut de Paleontologia Miquel Crusafont, founded in 1969, and inherited its Museum and Collections Conservation departments.

Catalonia has a long history, which helps us to understand the success that the ICP has achieved. This legacy includes the region's rich fossil deposits, extensive sites of extraordinary quality and above all, the works originally undertaken in his time by Doctor Miquel Crusafont, the real founder of the Catalan school of vertebrate paleontology.

The reserarch carried out by the ICP is founded on Catalonia's extensive peleontological heritage, as well as on projects outside our boundaries which are of special scientific significance and interest. Proof of this rich inheritance is the is ICP's collection of fossil vertebrates, one of the largest in the Iberian Peninsula, with nigh on 200,000 specimens of vertebrates which lived between 240 million and 100,000 years ago.

The ICP's collections, which grow year after year, thanks to the research projects, are a constant source of scientific work and consultation by paleontologists from all over the world. In this field, the ICP's Collections Management Department is outstanding. This Department has has become a centre of innovation at the forefront of the conservation of the natural and cultural heritage of the whole of Spain.

The ICP team consists jointly of a variety of professional typologies, who undertake the traditional paleontology tasks - excavations, taxonomy and description – while at the same time combining the most up-to-date techniques of virtual paleontology, based on advanced methodologies for observing fossils. Together they are able to blend paleontology with other scientific fields, such as philosophy, ecology and even genetics.

In addition, at the ICP headquarters, the fields of Preparation and Conservation are increasingly important, as has been manifested by the setting-up of the First Conservation Workhop. This is the first workshop on this subject matter set up on the peninsula, and it has been warmly welcomed by the attending public. As a result of the success it has achieved, the IPC is planning to set up a second workshop in the near future.

*The various typologies of professionals and the use of new methodologies the success achieved by the ICP*

Similarly, the IPC has a Funding and Projects Department. The aim of this department is to find the most suitable sources of funding (sponsors, grants, subsidiers, etc.) and process the recruiting of new pre-doctorate and post-doctorate research staff. The aim is to enable the ICP to have the means necessary in order to continue progressing and to remain at the forefront of paleontological research.

And during 2009, the ICP research staff achieved an exceptional volume in scientific production and a noteworthy level of quality in research. Proof of this is the series of articles published in magazines of the Science Citation Index (SCI), with a higher impact factor, as well as the conferring of an variety of grants and awards to the research staff.

Consequently, thanks to the combined work of each and every one of the members of the centre, the ICP is currently considered a benchmark centre in research, conservation and dissemination of human and vertebrate paleontology. For this reason, the Institut continues to promote the highest quality research, both nationally and internationally, with extraordinary and unprecedented results.

### Dissemination of the paleontological heritage

One of the ICP's fundamental aims is to disseminate and communicate the research done by researchers to society as a whole. This is probably the essential difference compared to the vast majority of research centres included in the CERCA programme. And within the ICP structure, there is a specific department for dissemination, the Miquel Crusafont Museum area, located at the Sabadell (Barcelona) centre.

The Miquel Crusafont Department is currently in a process of refurbishment, aimed at creating a museum which offers the visitor an interactive experience. The specific aim is to make the visitor the real protagonist in the various phases of exploration while he or she experiences, touches, looks and hears. So that no-one is excluded, various levels of comprehension are brought together, where both people with sensory reduction and people with special intellectual needs can acquire and delve into the information obtained.

The essential aim of this site is to communicate the importance of paleontological research. The kingpins will be the compiling of the processes undertaken during research, from the moment of discovery to the publication of an article, passing through the phases of preparation, study and conservation.

To achieve this, the ICP the communications media and the ICP's new website are of vital importance so that the various groups of people can be integrated and participate in the centre's paleontological project.

Three years after the creation of the IPC, we can say that the research work carried out in the centre has achieved extraordinary qualitative and quantitative levels. That is why we continue to be the benchmark vertebrate and human paleontology centre both nationally and internationally.

As a consequence, we are progressing confidently, and are proud to make this great challenge possible, and we thank our loyal sponsors, without whom we could not have reached this position: the Generalitat de Catalunya and the Universitat Autònoma de Barcelona. Thank you!

**SALVADOR MOYÀ-SOLÀ**
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- Coordination Staff
- Research Staff
- Collaborators

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## RESEARCH STAFF

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### Virtual paleontology group
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Pre-doctorate member

## COLLABORATORS

- Carlos Acosta
- Josep Aurell
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- Begonya Poza
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- Ivette Susanna

## Scientific advisory board

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# 2 Research Mesozoic Group

**The Mesozoic research group studies the fauna and flora of the Mesozoic Era, a geological period which has provided a large number of sites in the regions of Catalonia and Valencia.**

**The Mesozoic or Mesozoic Era was a period in the history of the Earth which began approximately 251 million years ago and ended 65 million years ago.**

**This period is also known as the Age of the Dinosaurs or the Age of the Reptiles, because of the great proliferation and diversity of these species in existence during this period.**

The Mesozoic is divided into three geological eras: the Triassic, the Jurassic and the Cretaceous. The Triassic comprised a single supercontinent named Pangaea, which was gradually breaking up.

By the end of the Mesozoic Era, during the Cretaceous, the continents had acquired a position similar to that of today.

One of the most important lines of study on the Mesozoic is centred on dinosaur sites of the Cretaceous, most of which are found on the Eastern Iberian Peninsula.

The climate during the Mesozoic was notably hot and humid. Part of what is today Europe and North America was flooded by deep seas. These climatic conditions brought about the appearance of ferns, moss, conifers (trees with cones) and cycads (palm trees). In the final period of the Mesozoic there appeared and spread plants with flowers, known as angiosperms.

The dinosaurs diversifed rapidly, especially during the Jurassic. The largest reptile group was that of the archosaurs, which included forms such as the dinosaurs and the crocodiles.

The lizards and snakes, as well as the mammals, prospered while the large dinosaurs disappeared due to the massive extinction of the Cretaceous-Tertiary. Some of the extinction hypotheses put forward include asteroid impacts, widespread volcanism and/or climate change (global cooling of the Earth).

*Fumanya is the biggest site with dinosaur impressions in Catalonia*

**Brief Annual Summary**

At present, the Mesozoic Research Department is continuing its activities in the framework of the 2008-2011 Catalan R+D+I Plan of the Ministry of Science and Innovation. The strategic objectives of this project are to finannce knowledge generation and promote quality research by means of recruiting and training new researchers and technologists, as well as to provide the research centres with the necessary technological equipment.

In addition, during 2009 a great deal of field work has been undertaken with a variety of paleontological excavations - specifically in the Pre-Pyrrenean regions of Catalonia and the Valencia regions of Els Ports and El Serans – and there has been participation in documentary projects such as the filming of a chapter for National Geographic Television on the the dinosaur ichnites (prints) at Fumanya, in the Barcelona region of El Berguedà.

Fumanya is the biggest site in Catalonia with dinosaur prints and the second largest Upper Cretaceous site in the world, with a total of 3,500 ichnites of titanosaur sauropods. The study of these ichnites has been undertaken in the framework of the collaboration agreement the ICP maintains with Manchester University. The joint work carried out has enabled very high quality images to be obtained using scanners applied to geology. These images have then been digitalised to generate highly detailed 3D virtual models. This technique permits a better understanding of the anatomy and special qualities of the locomotion and morphology of these dinosaurs.

In December 2002, the prints at the Fumanya sites and in other regions of the Iberian Peninsula were proposed as UNESCO World Heritage Sites. In his capacity as scientific advisor, Bernat Vila, a member of the Mesozoic group, has proposed the candidature of Fumanya, together with the governments of Asturias, La Rioja, Aragon and Castille-La Mancha. The International Union for the Conservation of Nature (IUCN) will pass its conclusions on to the UNESCO World Heritage Committee, which is made up of 21 states.

In addition, new campaigns have been initiated for prospecting in sediments from the Triassic Age in Catalonia and the first results have been presented at various international conferences. Specifically, a new form of amphibian recovered in Catalonia has been disclosed, as well as a wide variety of bone remains and impressions from Triassic sites in Catalonia, including fish, amphibians and reptiles.

This important plurality of forms is enabling the ecosystems exisiting during this period to be classified.

### Articles published in journals of the Science Citation Index (SCI)


Amills, M., Ramírez, O., Tomàs, A., Badaoui, B., Marmi, J., Acosta, J., Sànchez, S. & Capote, J. (2009) Mitochondrial DNA diversity and origins of South and Central American goats. Animal Genetics, 40: 315-322.

Antón, M., Salesa, M. J., Turner, A., Galobart, À. & Pastor, F. (2009) Soft tissue reconstruction of Homotherium latidens (Mammalia, Carnivora, Felidae). Implications for the possibility of representations in Palaeolithic art. Geobios, 42: 5, 541-551.

Dalla Vecchia, F. M. (2009) Tethyshadros insularis, a new hadrosauroid dinosaur (Ornithischia) from the Upper Cretaceous of Italy. Journal of Vertebrate Paleontology, 29: 4, 1100-1116.

Dalla Vecchia, F. M. (2009) The first Italian specimen of Austriadactylus cristatus (Diapsida, Pterosauria) from the Norian (Upper Triassic) of the Carnic Prealps. Revista Italiana di Paleontologia e Stratigrafia, 115(3): 291-304.

Dalla Vechia, F.M. (2009) Anatomy and systematics of the Pterosaur Carniadactylus Gen. N. Rosenfeldi (Dalla Vechia, 1995). Rivista Italiana di Paleontologia e Stratigrafia, 115: 159-188.

Marmi, J., Vila, B. & Galobart, À. (2009) Solemys (Chelonii, Solemydidae) remains from Maastrichtian of Pyrenees: evidence for a semi-aquatic lifestyle. Cretaceous Research, 30:1307-1312.

Piga, G., Santos-Cubedo, A., Moyà-Solà, S., Brunetti, A., Malgosa, A. & Enzo, S. (2009) An x-ray diffraction (xrd) and x-ray fluorescence (xrf) investigation in human and animal fossil bones from Holocene to middle Triassic. Journal of Archaeological Science.

Riera, V., Oms, O., Gaete, R. & Galobart, À. (2009) The end- Cretaceous dinosaur succession in Europe: the Tremp Basin record (Spain). Palaeogeography, Palaeoclimatology, Palaeoecology , 283: 160-171.


### Articles published in non-SCI journals


Dalla Vecchia, F.M. (2009) Telmatosaurus and the other hadrosaurids of the Cretaceous European Archipelago. An update. Natura Nascosta, 39: 1-18.

Gaete, R., Riera, V., Galobart, À., Marmi, J., & Oms, O. (2009) Geological and paleontological works of the ICP-UAB team in the Tremp syncline. In: Alcalá, L. & Royo-Torres, R. (eds.) Mesozoic Terrestrial Ecosystems in Eastern Spain. ¡Fundamental! 14: 51-58.

Jorquera, A., Santos-Cubedo, A., de Santisteban, C. & Galobart, À. (2009) Plesiosaurs (Reptilia: Sauropterygia) from the Arcillas de Morella Formation (Aptian, Lower Cretaceous) of Castellón (Spain). Paleolusitana, 1: 229-235.

López-Martínez, N., Galobart, A., Vicens, E., Arribas, M. E., Diaz, M., Domingo, L., Estrada, R., Fernández-Marrón, M. T., Fonollá, F., Gaete, R., Lacasa, A., Lozano, J., Malchus, N., Marmi, J., Peralba, J., Riera, V., Robador, A., Oms, O., Sellés, A. G., Soler-Gijón, R.,

Torices, A. & Vila, B. (2009) Upper Mesozoic continental deposits of South-eastern and South-central Pyrenees. In Alcalá, L. and Royo-Torres, R. coord. Mesozoic Terrestrial Ecosystems in Eastern Spain. ¡Fundamental! 14:3-91.

# *Manchester University collaborates with the group in the study of ichnites at Fumanya*

Poza, B., Santos-Cubedo, A., Guardiola, M. & Suñer, M. (2009) First citation of Baryonychinae (Theropoda, Spinosauridae) on the Hauterivian terminal-Barremian basal (Formación Cantaperdius) at Castelló (Spain). Paleolusitana, 1: 391-396.

Santos-Cubedo, A., Furió, M., Olid, C. & Garcia Orellana, J. (2009) First results of the measurement of uranium concentrations in the bones of dinosaurs of the Cretaceous and the rate of gamma dosage in their place of storage. Paleolusitana,1: 425-430.

Vila, B., Oms, O., Marmi. J., Galobart, À., Riera, V., Estrada, R. & Malchus, N. (2009) Vallcebre Syncline. In: Alcalá, L. & Royo-Torres, R. (eds.) Mesozoic Terrestrial Ecosystems in Eastern Spain. ¡Fundamental! 14: 23-34.

Vila, B., Sellés, A. G., & Galobart, À. (2009) The Coll de Nargó nesting area. In: Alcalá, L. & Royo-Torres, R. (eds.) Mesozoic Terrestrial Ecosystems in Eastern Spain. ¡Fundamental! 14: 42-45.

### Proceedings

Santisteban, C., Suñer, M. & Vila, B. (2009) The site of dinosaur ichnites at Cañada Paris, Alpuente, Valencia. In (Colectivo Arqueológico-Paleontológico Salense, Ed.): Minutes of the Fourth Symposium on Dinosuars and their Environment. 299-307. Salas de los Infantes, Burgos, Spain.

Poza, B., Santos-Cubedo, A., Suñer, M. & Galobart, A. (2009) ANA: Opening up of a dinosaur site for development in a rural environment (Cinctorres, Castellón). Minutes of the Fourth International Symposium on Dinosaur Paleontology and their environment. Salas de los Infantes (Burgos): 293-300.

### Scientific dissemination articles

Vila, B. i Alba, D.M. (2009) Feathers, dinosaurs and birds: which came first, the feather or the bird? Omnis Cel·lula, 20: 10-15.

### Books and book chapters

Poza, B., Santos-Cubedo, A., Suñer, M. & Vila, B. (2009) Dinosaurs: terribly large reptiles. ISBN: 978-84-613-2117-9.

Poza, B., Santos Cubedo, A. & Suñer, M. (2009) The dinosaurs in Cinctorres. ISBN: 978-84-613-0818-7.

### International and national conferences

Tribute to Charles Darwin and Bernissart Iguanodonts -New prespectives on Vertebrate Evolution and Early Cretaceous Ecosystems. Brussels Fourth International Symposium on Dinosaur Eggs and Babies - Bozeman. USA 8th Annual Meeting of Society of Vertebrate Paleotology. Bristol, United Kingdom

European Geosciences Union (EGU). Vienna. VII EJIP. Torres Vedras, Portugal. 10th International Meeting on Mesozoic Terrestrial Ecosystems and Biota. Terol.

### Congress abstracts

Santos-Cubedo, A., de Santisteban, C. & Galobart, À. (2009) New Dinosaur findings from Arcillas de Morella Formation (Spain). Abstracts book of Tribute to Charles Darwin and Bernissart Iguanodonts (New prespectives on Vertebrate Evolution and EarlyCretaceous Ecosystems), Brussels: 87.

de Santisteban, Santos-Cubedo, A. (2009) The record of climate and eustatic changes during the lower cretaceous in the "Arcillas de Morella Formation" (Spain). Abstracts book of Tribute to Charles Darwin and Bernissart Iguanodonts (New prespectives on Vertebrate Evolution and Early Cretaceous Ecosystems), Brussels: 86.

Santos-Cubedo, A., de Santisteban, C., Suñer, M. & Galobart, À. (2009) New dinosaur fossils from Ana locality, arcillas de morella formation (Aptian, Lower Cretaceous, Cinctorres, Spain). Geophysical Research Abstracts, Vol 11, EGU2009-12608.

de Santisteban, C. & Santos-Cubedo, A. (2009) The rhythm of the eustatic changes as a control of the depositional architecture in Mesozoic deltaic deposits (Ibero-levantine and Maestrat basins, Spain). Geophysical Research Abstracts, Vol 11, EGU2009-12600.

Oms, O., Dinares-Turell, J., Riera, V., Gaete, R., Vila, B. & Galobart, À. (2009) The continental Cretaceous-Paleogene transition fromthe southern Pyrenees: magnetostratigraphy and vertebrate succession correlations. Berichte Geol. B.-A., 78 (ISSN 1017-8880) - RECCCE Workshop, Gams (25.04. - 28.04.2009): 32

Del Cerro, I., Ferrando, A., Marmi, J. & Bosch, M. (2009) Taxonomic review of the Meles genus (Carnivore, Mustelidae) based onnew molecular data. Ninth Symposium on Evolutionary Biology,Barcelona. Abstracts book: 9.

Suñer, M., de Santisteban, C. & Galobart, À. (2009) Direct evidence of Titanosauriformes found in a Upper Jurassic site of Alpuente (Los Serranos, Valencia, Spain). Abstracts 10th International Meeting on Mesozoic Terrestrial Ecosystems and Biota (Delgado & Fregenal coord.): 139.

Fortuny, J., Galobart, À., de Santisteban, C. & Sellés, A. G. (2009) The vertebrate assemblage of La Mora (Middle Triassic, NE of Iberian Peninsula): preliminary results. Abstracts 10th International Meeting on Mesozoic Terrestrial Ecosystems and Biota (Delgado & Fregenal coord.): 161.

Valdiserri, D., Fortuny, J. & Galobart, À. (2009) New insight on old material: Triassic tetrapods footprints in Catalonia (NE Iberian Peninsula). Abstracts 10th International Meeting on Mesozoic Terrestrial Ecosystems and Biota (Delgado & Fregenal coord.): 163.

Fortuny, J., Garcia-Alix, A., Garcia-Martinez, R. & Val, S. (2009) MATRIX: Technological world against the hard sediments. I Conservation Workshop, Sabadell.

Malchus, N., Riera, V., Marmi, J. & Oms, O. (2009) Coal "cyclothems" and molluscs in the end-Cretaceous dinosaur-trace land – the Vallcebre case (Catalunya, Spain)Abstracts 10th International Meeting on Mesozoic Terrestrial Ecosystems and Biota (Delgado & Fregenal coord.): 189.

Marmi, J., Villalba-Breva, S., Martín-Closas, C. & Gomez, B. (2009) Cheirolepidiaceous peat mires linked to Charophyte lakes in the Maastrichtian of the Eastern Pyrenees (Catalonia, Spain). Abstracts 10th International Meeting Mesozoic Terrestrial Ecosystems and Biota (Delgado & Fregenal coord.): 237.

de Santisteban, C. & Santos-Cubedo, A. (2009) Environmental meaning of the breccias and conglomerates with dinosaurs remains in the deposits with Purbeck and Weald Facies of the Eastern Part of Iberian Systems (Spain). Abstracts 10th International Meeting on Mesozoic Terrestrial Ecosystems and Biota (Delgado & Fregenal coord.): 255.

Santos-Cubedo, A., Suñer, M., Poza, B., de Santisteban, C. & Galobart, À. (2009) New insights in taphonomy of the Ana site (Lower Cretaceous, Cinctorres, Spain). Abstracts 10th International Meeting on Mesozoic Terrestrial Ecosystems and Biota (Delgado & Fregenal coord.): 287.

Vila, B., Sellés, A. G., Fortuny, J., Galobart, À. & Jackson, F. (2009) Re-Assessment of the European Megaloolithid Clutch Morphology. Fourth International Symposium on Dinosaur Eggs and Babies (Varricchio, Horner, Jackson and Selenitsky eds.). Museum of the Rockies Occasional Paper, 4: 31.

Vila, B,. Galobart, A., Canudo, J. I., Le Loeuff, J. & Oms, O. (2009) Late Cretaceous sauropod diversity in Southern Europe. Abstracts of SVP 68th Annual Meeting. Journal of Vertebrate Paleontology, 29(3):196A.

Fortuny, J., Galobart, À. & de Santisteban, C. (2009) New capitosaur taxa (Amphibia: Temnospondyli) from the Middle Triassic (Early-Middle Anisian) of Iberian Peninsula. Abstracts of SVP 68th Annual Meeting. Journal of Vertebrate Paleontology, 29(3):97A.

Bolet, A. & Evans, S. (2009) A new lizard (Lepidosauria, Squamata) from the Early Cretaceous of the Montsec range (Catalonia, Spain). Abstracts of SVP 68th Anual Meeting. Journal of Vertebrate Paleontology 29(3):67A.

Dalla Vecchia, F. M. (2009) New and extraordinarily complete hadrosauroid dinosaur (Ornithischia) from the Upper Cretaceous of Italy. Abstracts of SVP 68th Anual Meeting. Journal of VertebratePaleontology, 29(3): 85A.

### Review of scientific articles

Àngel Galobart: Ameghiniana (Asociación Paleontologica Argentina).

Àngel Galobart: Journal of Anatomy (Wiley. Blackwell Publishig, Inc).

Àngel Galobart: Agencia Nacional de Evaluación de Proyectos (ANEP), Plan Nacional I+D (2008-2011)

Àngel Galobart: Agència de Gestió d'Ajuts Universitaris i de Recerca de la Generalitat de Catalunya (AGAUR)

Bernat Vila: Ameghiniana (Asociación Paleontológica Argentina), Impact factor: 0.741

Bernat Vila: Paleolusitania, Paleontology and Palaeoecology magazine (Miniutes of 8th Meeting of Young Researchers in Paleontology), No. 1.

Nikolaus Malchus: Mexican Geological Sciences journals.

Nikolaus Malchus: Journal of Molluscan Studies.

Nikolaus Malchus: Palaeontology.

Nikolaus Malchus: Cretaceous Research.

Nikolaus Malchus: Journal of the marine biological Ass. of the UK.

Nikolaus Malchus: Agencia Nacional de Evaluación de Proyectos (ANEP), Plan Nacional I+D (2009-2012).

Fabio Marco Dalla Vecchia: Palaeogeography, Palaeoclimatology, Palaeoecology.

Fabio Marco Dalla Vecchia: Anais da Academia Brasileira de Ciências.

### Scientific dissemination activities

Bernat Vila: Technical advisor for the contents of the scientific dissemination book "La Laura i en Joan rere el rastre dels dinosaures" ("Laura and Joan follow the trail of the dinosaurs". of the Recerca Activa collection. Minstry of Innovation, Universities and Enterprise Commissioned by Universities and Research General Research Management. Published: March, 2009.

Bernat Vila: Conference titled "Are there still dinosaurs among us?" Science Fair 2009, Parc de la Ciutadella, Barcelona. Organised by: Institut de Cultura de Barcelona (14 June, 2009).

Vila, B. i Galobart, À. (2009) "Escaneando las huellas de los dinosaurios" ("Scanning the footprints of the dinosaurs"). Diario de los Dinosaurios, 5: 3.

Marmi, J. Conference titled "The dinosaurs' poor relations: what do they tell us about the last Pyrennean dinosaurs?" European Heritage Symposium. Museu d'Isona-Conca Dellà, Isona-Conca Dellà (26 September, 2009).

Marmi, J. Conference titled "A brief journey through the history of life". IES Guillem de Berguedà (1st and 2nd year "BAT" students), Berga (16-17 December, 2009).

### Presentations by posters and speakers at Conferences

Vila, B. Pòster al Fourth International Symposium on Dinosaur Eggs and Babies (August, Bozeman, Montana, United States at 68th Anual Meeting of Society of Vertebrate Paleontology (September, Bristol, United Kingdom).

Dalla Vecchia, F.M. Poster at 68th Annual Meeting of Society Paleontology (September, Bristol, United Kingdom).

Malchus, N. Talk at the 10th International Meeting on Mesozoic and Biota (September,Terol).

Marmi, J. Pòster a 10th International Meeting on Mesozoic Terrestrial Ecosystems and Biota (Setembre,Terol).

Fortuny, J. Author and co-author of two posters at 10th International Meeting Mesozoic Terrestrial Ecosystems and Biota (September,Terol). Pòster a 68th Annual Meeting of Society of Vertebrate Paleotology (Setembre, Bristol, Anglaterra). Poster at the First Conservation Workshop

Santos-Cubedo, J. Pòster a 10th International Meeting on Mesozoic Terrestrial Ecosystems and Biota (Setembre,Terol). Poster a Tribute to Charles Darwin and Bernissart Iguanodonts (New prespectives on Vertebrate Evolution and Early Cretaceous Ecosystems), (Brussels). Poster at European Geosciences Union (EGU), (Vienna). Speaker at Seventh EJIP (Torres Vedras, Portugal).

Bolet, A. Poster at 68th Anual Meeting of Society of Vertebrate Paleontology (Setembre, Bristol, United Kingdom).

### Scientific committees and organisation of symposiums

Dalla Vecchia, F.M. member of the Scientific Committee of the "International Conference on Vertebrate Palaeobiogeography and continental bridges across Tethys, Mesogaea, and Mediterranean Sea", Bologna, 27-30. Field-trip leader at the dinosaur site of Villaggio del Pescatore, Trieste (Italy) (30 September).

Bolet, A. member of the organising committee of the Morphometrics and Phylogeny course, taught from 7 to 9 April 2010 at the UAB.

Carrying-out of the Iberian Track Project in collaboration University of Manchester University (United Kingdom). Laser scanning work at the 11 sites with dinosaur ichnites on the Iberian Peninsula (Portugal and Spain) included in the candidature for UNESCO World Heritage Site. Researchers: Galobart, À., Vila, B., Garcia-Sellés, A. i Bolet, A.

Carrying-out of the Pre-Symposium Fieldtrip to the Pyrenees in the framework of the 10th International Meeting Mesozoic Terrestrial Ecosystems and Biota (Setembre,Terol). Participating researchers: Galobart, À., Garcia-Sellés, A., Marmi, J. i Vila, B.

### Technical reports and summaries

Gaete, R., Marmi, J. i Riera, V. Report on the paleontological excavation undertaken between 1 and 10 July 2009 at the Barranc de Torrebilles 3 site (Isona i Conca Dellà, Pallars Jussà) and the supplementary research and preparation works of the 2008-2009 campaigns. Ministry of Culture and the Media, Archaeology and Paleontology Service (Generalitat de Catalunya). November 2009.

Marmi, J., Vila, B. i Poza, B. Report on the paleontological works in the Fumanya area (Cretaci Superior, Berguedà). 2009 period. Ministry of Culture and the Media, Archaeology and Paleontology Service (Generalitat de Catalunya). November 2009.

Fortuny, J. and Bolet, A. Technical report and summary of the paleontological prospecting works at the lithographic limestone sites of Montsec (Lower Cretaceous, La Noguera).

Vila, B. Report on the paleolontological control activities in the filming at the Fumanya sites (Berguedà, Barcelona). Ministry of Culture and the Media, Archaeological and Paleontology Service (Generalitat de Catalunya). September 2009.

Vila, B., Galobart, À. i Marmi, J. Report on the paleontological works at the Fumanya sites. December 2009. Ministry of Culture and the Media, Archaeology Service (Generalitat de Catalunya). September 2009.

Santos, A. Report on the 6th paleontological excavation campaign at the ANA site (Lower Cretaceous, Cinctorres, Castelló). Presented to the Directorate-General for Cultural Heritage, Council for Culture and Sport of the Generalitat Valenciana.

Santos, A. Preliminary report on the 5th paleontological excavation campaign at the ANA site (Lower Cretaceous, Cinctorres, Castelló). Presented to the Directorate-General for Cultural Heritage, Council for Culture and Sport of the Generalitat Valenciana.

### Participation in thesis and dissertation committees

Galobart, À. Second member of the Systematic Thesis Committee and phylogenetic and palio biogeographical implications of the Galvesaurus herreroi seraupods (Formación Villar del Arzobispo, Galve, Spain), presented by José Luís Barco to the University Saragossa on 27 February 2009.

Galobart, À. Member of the Committee on research work of the Official Interuniversity Master's Degree in Paleontology, year 2008-2009. Meeting Room of the UB Faculty of Geology, 8 July 2009.

Galobart, À. Member of the committee on the thesis "Description of a new lizard (Lepidosauria, Squamata) from la Pedrera de Meià fossil site (Early Cretaceous, Catalonia)" presented on 14 September 2009 at the Universitat Autònoma de Barcelona by Arnau Bolet, within the Doctorate in Geology Programme.

### Teaching

Galobart, À. i Marmi, J. have participated as teachers of the Vertebrate and Human Paleobiology Module of the Master's Degree in Paleontology taught at the Universities of Barcelona and Autònoma de Barcelona.

### Paleontological excavations

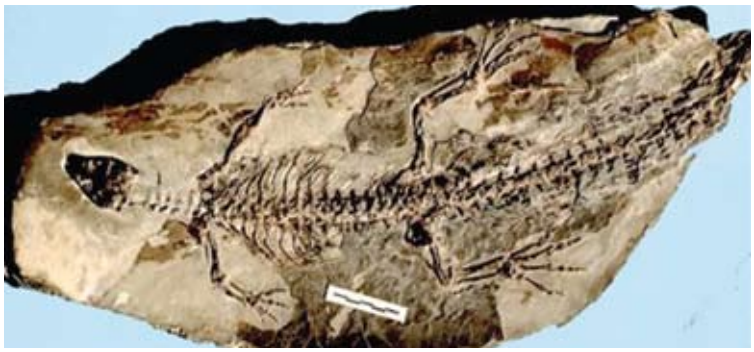
Lower Cretaceous site at Ana (Cinctorres, Castelló) from 1 to 24 June. Directors: Santos-Cubedo, A., Suñer, M. i Galobart, À. Upper Cretaceous site at Basturs Poble (Isona and Conca Dellà, Lleida) from 11 to 24 July. Directors: Galobart, À., Gaete, R. i Riera, V.

Upper Cretaceous site at Pinyes and Vall del Riu Sallent (Coll de Nargó, Lleida)-494/K121-N-236; Directors: Garcia- Sellés, A., Galobart, À. and Fortuny, J.

Upper Cretaceous site at Torrebilles 3 (Isona and Conca Dellà, Lleida) from 1 to 30 July. Excavations directors: Marmi, J., Riera, V. and Gaete, R.

Prospection works at Fumanya Sinclinal de Vallcebre (Fígols i Vallcebre, Barcelona) from 3 to 15 August 2009. Excavations directors Marmi, J., Vila, B. i Poza, B. Santos, A. Preliminary Report on the 5th paleontological excavation campaign at the ANA site (Lower Cretaceous, Cinctorres, Castelló). Presented to the Directorate General for Cultural Heritage, Council for Culture and Sport of the Generalitat Valenciana.

Prospecting work on the Triassic facies of the Montseny sector (Valles Oriental) from 17 June to 15 July (Tagamanent, Figaró-Montmany and Aigufreda in the Vallès Oriental, and Brull, Seva,



Centelles and l'Abella, a town in Sant Martí de Centelles, a Osona)-470 K121. Directors: Garcia-Selles, A., Bolet, A. and Fortuny, J. Excavation of the Lower Triassic in Russia (Volograd Region) Directors: Shishkin, M. Novikov, I. and Fortuny, J.

## Research projects

During 2009, a three-year project was undertaken for the Ministry of Science and Innovation for 2009-2011; at the same time, the Mesozoic Research Group was recognised as a "Singular Research Group" by the Universities and Research Grants Agency for the period 2009-2013.

Coordinated research project "Evolution of the dinosaurs on the Eastern Iberian Peninsula during the Cretaceous: Sistemática Paleobiological and Paleoecological systematics and inferences". Dependong on the Ministry of Science and Innovation, 2009-2011. CGL2008- 06533-C03-01/BTE, Funding 58,000 Euros. Chief Researcher: Dr. Àngel Galobart Lorente.

"Research project on th the paleontological sites of the Cretaceous-Paleogene transition of the Catalan Pre-Pyrenees: Systematics, Paleoecology and paliobiogeographical implications 2007-2011". Presented to The Research and Knowledge Department of the Directorate-General of Hertiage, of the Ministry of Culture of the Generalitat de Catalunya Director Àngel Galobart.

"Research project on the Triassic outcrops with vertebrate fauna in Catalonia. 2008-2011". Presented to the Research and Knowledge Department of the Directorate-General of Heritage, Ministry of Culture of the Generalitat de Catalunya. Directors, Àngel Galobart and Josep Fortuny.

Recognition of the "Mesozoic Research Group" as a Singular Research Group by the Universities and Research Grants Agency for the period 2009-2013.

## Funds and grants awarded

Funds for excavations for 2008 and 2009 of the of the Ministry of Culture, Directorate-General of Heritage, for the sites at Basturs Poble and Torrebilles (Isona and Conca Dellà), Fumanya Sud i Cingles del Boixader (Fígols), Pinyes (Coll de Nargó): 36,600

Award of an FPI grant from the Sub-Directorate of Training and Mobility of Researchers of the Ministry of Science and Innovation for the research project "Evolution of the Dinosaurs on the Eastern Iberian Peninsula during the Cretaceous: Sistemática e Paleobiological and Paleological systemics and inferences". Recruitment of the FPI grant-holder Arnau Bolet Mercadal dated 1 October 2009)

Synthesys grant: Awarded to Josep Fortuny (2009). Destination: Museum fur Naturkunde (Berlin, Germany). Project title: Functional morphology of capitosauroids (Amphibia, Temnospondyli): implications for locomotion and feeding.

Grant for funding actions in the sphere of scientific dissemination to the project "ANA", an interactive dinosaur site" by the Universities and Research Grants Agency to Andrés Santos-Cubedo.

# 3

## Research Neogene and Quaternary faunas

**At the end of the Cretaceous Era, some 65 milion years ago, dinosaurs became extinct. This meant that the mammals became the quintessential fauna of the Cenozoic Era, which is divided into three periods: the Paleogene, Neogene and Quaternary. The diversification of the mammals was spectacular and in the Paleogene this brought about the apperance of primitive representatives of many of today's orders.**

The Neogene and Quaternary Faunas Research Group is involved in studying the fossils and dynamics of the ecosystems and climates from 23 million years ago to the present day.

During the Paleogene, the continents occupied diferent positions to those of today and the climate was considerably warmer, so that tropical forests covered a large part of Europe. The world as we know it today began to take shape during the Neogene, in other words between 23 and 26 million years ago. In this second period of the Cenozoic Era, the continents began to move towards their current positions and global temperatures dropped to something close to today's. The global cooling trend reached its maximum level during the Quaternary - a period that began 26 million years ago, and which continues to the present day - when the glacial dynamics were established.

During the whole of the Quaternary, cold glacial phases have alternated with warmer interglacial phases, like the one we are living through today. All of these important physiographic and climate changes affected the evolution of the continental ecosystems and faunas, and in the latest stage, that of the first human beings.

Catalonia is a country with abundant vertebrate fossils from the Neogene and Quaternary. Renowned paleontologists such as Miquel Crusafont, Jaume Almera or Ramon Bataller study these sites and make them well known all over the world. The Neogene and Quaternary Faunas Research Group has inherited this long research tradition and continues to work on the sites of this age in Catalonia. One of the principal areas of study is the miocene successions of the Vallès-Penedès basin, which comprise sites as important as those at Cassots, Can Llobateres or the area of Hostalets de Pierola-Piera, which represents an almost continuous record of the continental ecosystems of between 23 and 8 million years ago. Other smaller basins, such as those at La Seu d'Urgell,

La Cerdanya or l'Empordà also rate special interest due their deposits of Neogenic vertebrates.

With regard to the Quaternary, the spectacular sites of Terrassa (Cal Guardiola and Vallparadís) stand out for having provided thousands of excellently-preserved remains, as well as the karstic sites in the Garraf massif (Avenc Marcel or Cova Bonica) or those of the Banyoles-Besalú Basin (Incarcal quarry).

The group carries out an in-depth study of the vertebrate fauna and describes new genera and fossil species, as well as focusing on these from a palio biological standpoint, ie. the study of the species under a biological approach, where the lifestyle of the extinct forms is deduced. In addition, biostratigraphy and biochronology, disciplines that study the succession of fossils in rock strata and in time, play an important role in what may be inferred from the age of sites, based on correlations with some continental vertebrate groups (such as the small mammals).

Finally, the Neogene and Quaternary Faunas Research Group also pays special attention to paleontology, i.e. the reconstruction of the ecosystems and climate in the past, as well as the study of their evolution over time.

*Catalonia has numerous vertebrate fossil sites belonging to the Neogene and Quaterny*

## Brief Annual Summary

During 2009, the Neogene and Quaternary Faunas Research Group continued studying the various Catalonian Miocene sites (23-5 mya) as well as the Pliestocene (2.6-0.12 mya), and Pliocene sites (5-2.6 mya) at Castelló. In addition, largely thanks to the the recruiting of new members to the research group, studies have got underway on the successions in other Neogene basins of the Iberian Peninsula, such as those at Calatayud and Terol.

As regards the study of Miocene deposits, a large part of the efforts has been directed to the study of the fossils recovered in the Els Hostalets de Pierloa area, due to the extension works on the Abocador de Can Mata (ACM) rubbish dump. These works, initiated in 2002, have until now enabled tens of thousands of vertebrate fossil remains to be recovered and hundreds of new sites to be located, spread along a continuous stratigraphic series of almost 300 metres. It should be mentioned that in these sites a series of important works have been carried out on fossil primates, such as Pierolapithecus or Anoiapithecus.

The dating of these sites has achieved high resolution thanks to the combination of biostratigraphic and magnetostratigraphic data (based on the polarity of the magnetic minerals in the rocks). It has thus been possible to establish that the stratigraphic series of the ACM comprises a time-lapse between 12.5 mya and 11 mya, and that the majority of the sites that have produced primate remains have ages very close to 12 mya.

To undertake this task, the ICP has collaborated with scientists of the Jaume Almera Institute of Earth Sciences and with the University of Barcelona. The two works published (Moyà-Solà et al., 2009a, 2009b) are mainly dedicated to describing the new remains at the Abocador de Can Mata (ACM).

With regard to the systematic studies of the ACM faunas, this year's efforts have been directed at describing the insectivores and rodents of variois localities, as well as some carnivore genera. With reference to this group, the study of the dentition of the Trocharion albanense mustelid is particularly important. This investigation has permitted the relationships this specimen had with other mustelids to be clarified (Robles et al., 2009).

Furthermore, in collaboration with members of Naturalis (Leiden, Holland), studies have been carried out on the insectivore faunas of the Miocene in the Calatayud and Montalban basins. This has enabled the existence of a sub-family of soricidae (shrews) to be confirmed - the allosoricinae (Van den Hoek Ostende et al., 2009). Completely independently, the allosoricinae developed a fourth lower premolar similar to that of red-toothed shrews (soricinae).

With regard to the Miocene successions, two new study methods were introduced in 2009 - cyclostratigraphy and the analysis of stable isotopes. Cyclostratigraphy refers to the the study of atronomically-originated climatic cycles which affect sediment layers. It is known that the climate changes cyclically due to the also-cyclical changes in the Earth's orbit around the Sun. All of these cycles leave recognisable traces in the sedimentary record, like changes in lithology. It has therefore been suggested that we can also observe similar cyclicity in the biological record. Van Dam was one of the first people to propose this hypothesis for the small mammals record of the Miocene on the Iberian Peninsula (see Van Dam et al., 2006) and has carried out a variety of studies in the Catalayud and Terol basins. These cyclostratigraphic studies continued in 2009, principally in the Terol basin, and some preliminary results have been presented.

With regard to stable isotopes (atomic variant of a chemical element), studies have been carried out on the oxygen isotopes present in the teeth of fossil horses of the Upper Miocene and the Pliocene in the Terol and Cabriel basins (centre of the Peninsula).

The results indicate that the average temperature during the Upper Miocene was five degrees higher than today's and that there were practically no C4-type plants, such as grasses (Van Dam & Reichart, 2009). In the future, these techniques are expected to be applied to other records, such as that of the Vallès-Penedès Basin.

In collaboration with researchers from the University of Florence, a study on the rodent faunas in the locality of Fiume Santo (Sardinia) has been undertaken. This locality has produced remains of the enigmatic Oreopithecus bambolii, the last large anthromorph to inhabit the Mediterranean region during the Upper Miocene, which survived isolated in the archipelago which then defined Tuscany and Sardinia. The study of the Fiume Santos rodents not

only will permit the chronology of this locality to be refined, but will also make it possible to reconstruct the environment in which Oreopithecus lived.

As regards the Pliocene sites, special attention has been paid to the karstic sites at Almenara-Casablanca (Castelló) and the oldest remains in Europe of the Meles genus have been described. These include present-day badgers (Madurell et al., 2009a). This find confirms that badgers, which originated in Asia during the Lower Pliocene, spread throughout Europe before the beginning of the glacial movements of the Quaternary, 2.6 mya ago.

With regard to Pleistocene sites, in Terrassa two of the richest sites have been discovered of the Lower Pleisocene in Eurasia - Cal Guardiola and Vallparadís. These localities have produced over 30,000 fossil vertebrate remains, which are currently being studied (Madurell et al., 2009c). In 2008, the study of the Cal Guardiola carnivores got underway.

This was partially published during 2009 (Madurell et al., 2009b, 2009d).

The Cal Guardiola carnivore fauna include a mixture of elements of African origin (short-snouted hyenas, certain sabre-toothed felines and jaguars) and others of Eurasian origin (foxes, wolves and bears). In this last group, the presence of Ursus deningeri, the ancestor of the popular cave bear, stands out. Studies have also been done of the remains of European pumas (Puma pardoides) at a variety of localities on the Iberian Peninsula, including Vallparadís. This study has enabled the European forms to be recognised as ancestors of present-day pumas (Puma concolor), which inhabit North and Central America.

With regard to the large mammals of the Pleistocene, the small equids of Vallparadís have been studied, and there has been a preliminary citation of the presence of Equus cf. hydruntinus (Aurell et al., 2009). This would be the the oldest citation of this species of horse, and it could be related to today's onagers or Asian wild asses. The study of Pleistocene faunas has also taken in other sites outside Catalonia, such as the rich microvertebrate sites of the Guadix-Baza Basin (Granada), (Agustí et al., 2009). This study has been undertaken in collaboration with members of the Institute of Human Palioecology and Social Evolution of the Univesitat Rovira i Virgili (Tarragona) and has permitted a first approximation to be made of the reconstruction of the paleoenvironment of this basin during the Upper Pliocene and Lower Pleistocene.

Finally, mention should be made of the creation of a new line of research in the group, which will study the paleobiology of small mammals. Small mammals very often dealt with in paleoenvironmental reconstruction and in order to produce paleoclimatic inferences. The first preliminary results of this line of research were presented at several conferences during 2009. Thus, Casanovas-Vilar & Van Dam (2009) showed how the shape of the jaw in today's rodents is related to their diet and modus vivendi, meaning that it would be possible to carry out a similar study with fossil jaws and infer these parameters for extinct species. Furió et al (2009) also reconstructed the lifestyle of the Beremendia shrew, which injected venom while biting in order to paralyse the invertebrates it fed on. It most probably did not consume these on the spot, but stored them for times of scarcity of prey.


### Articles published in journals of the Science Citation Index (SCI)

Bret Bennington, J., W. A. DiMichele, C. Badgley, R. Bambach, P. M. Barrett, A. K. Behrensmeyer, R. Bobe, R. J. Burnham, E. B. Daeschler, J. van Dam, J. T. Eronen, D. H. Erwin, S. Finnegan, S. M. Holland, G. Hunt, D. Jablonski, S. T. Jackson, B. F. Jacobs, S. M. Kidwell, P. L. Koch, M. K. Kowalewski, C. C. Labandeira, C. V. Looy, S. K. Lyons, P. M. Novack-Gottshall, R. Potts, P. D. Roopnarine, C. A. E. Strömberg, H.-D. Sues, P. J. Wagner, P. Wilf & S. L. Wing. (2009) Critical issues of scale in paleoecology. Palaios, 24: 1-4.

De Miguel, D., Cegoñino, J., Azanza, B., Ruiz, I. & Morales, J. (2009) The chewing biomechanics of deer analyzed by Finite Element Method (FEM). Journal of Vertebrate Paleontology, 29: 85-87.

Madurell-Malapeira, J., Santos-Cubedo, A., Marmi, J. (2009) Oldest Ocurrence of Meles (Mustelidae, Carnivora) from the Middle Pliocene (MN16) of Almenara-Casablanca-4 Karstic site (Castellón, Spain). Journal of Vertebrate Paleontology, 29 (3): 961-965.

Madurell-Malapeira, J., Alba, D. M., Moyà-Solà, S. (2009) Carnivora from the late Early Pleistocene of Cal Guardiola (Terrassa, Vallès-Pendès Basin, Catalonia, Spain). Journal of Paleontology, 83 (6): 969-974.

Van Dam, J.A. & Reichart, G.J. (2009) Oxygen and carbon isotope signatures in Late Neogene horse teeth from Spain and application as temperature and seasonality proxies. Palaeogeography, Palaeoclimatology, Palaeoecology, 274: 64-81.

Van den Hoek Ostende, L. W., Furió, M. & García-Paredes, I. (2009) New data on Paenelimnoecus from the Middle Miocene of Spain in support of the subfamily Allosoricinae (Soricidae, Mammalia). Acta Palaeontologica Polonica, 54(1): 159-164.

Troost, T.A., Van Dam, J.A., Kooi, B.W. & Tuenter, E. (2009) Seasonality, climate cycles and body size evolution. Mathematical Modeling of Natural Phenomena, 4: 135-155.

Troost, T.A., Van Dam, J.A., Kooi, B.W. & Tuenter, E. (2009) Seasonality, climate cycles and body size evolution. Mathematical Modeling of Natural Phenomena, 4: 135-155.

### Articles published in non-SCI journals

Casanovas-Vilar, I. & Van Dam, J.A. (2009) Landmark-based morphometrics of micromammal mandibles and effects of phylogeny and function: preliminary results. First Iberian Symposium on Geometric Morphometrics, Sabadell, 23-25 July, 2009.Paleontology and Evolution, Special Report 3: 41-42.

Furió, M. & Santos-Cubedo, A. (2009) On fossil postcranial bones of Neogene and Quaternary insectivores (Eulipotyphla, Mammalia), with some remarks to the material from Almenara-Casablanca 1 (Castelló, Spain). Paleolusitana, 1: 183-188.

Madurell-Malapeira,J., Aurell, J., Alba, D. M., Moyà-Solà. S. (2009) The Epivillafranchian fossiliferous levels of Vallparadís (Terrassa, Barcelona, Spain). Paleolusitana, 1: 237-243.

Robles, J.M., Alba, D.M. & Moyà-Solà, S. (2009) Morphology of the upper fourth premolar in Trocharion albanense Major 1903 (Mustelidae: Leptarctinae) and the independent loss of the carnassials notch in leptarctines and other mustelids. Paleolusitana, 1: 403-409.

### Proceedings

Agustí, J., Blain, H.-A., Furió M., De Marfà, R. & Santos-Cubedo, A. (2009) The Late Pliocene-Early Pleistocene small vertebrate succession from the Guadix-Baza Basin (SE Spain). Journal of Vertebrate Paleontology, 29 Suppl. 3: 52A.

Aurell-Garrido, J., Madurell-Malapeira, J., Alba, D. M., Moyà-Solà, S. (2009) Small equid remains from the early Middle Plesitocene of Vallparadís (Terrassa, Barcelona, Spain). [Abstract]. Journal of Vertebrate Paleontology, 29 Suppl. 3: 57A.

Casanovas-Vilar, I., García-Paredes, I., Alba, D.M. & Van den Hoek Ostende; L.W. (2009) The European Far West: mammal diversity dynamics in the Iberian Peninsula. Acta Naturalia de "L'Atenneo Parmense", 45 (1/4): 281-282.

Casanovas-Vilar, I.; García-Paredes, I.; Alba, D.M.; van den Hoek Ostende, L.W. & Moyà-Solà, S. (2009) The Biogeography of the Late Miocene faunal turnover in Europe. Evolutionary Islands 150 years after Darwin, abstract volume: 11-12.

*The group has collaborated with scientists from the Insitute of Earth Sciences and with the Barcelona University (UB)*

Furió M., Agustí, J., Mouskhelishvili, A., Sanisidro, Ó. & Santos-Cubedo, A. (2009) A new interpretation on the use of venom in the Plio-Pleistocene shrew Beremendia (Insectivora, Mammalia). Journal of Vertebrate Paleontology, 29 Suppl. 3: 101A.

Madurell-Malapeira, J., Alba, D. M., Moyà-Solà, S. (2009) Carnivora from the late Early Pleistocene of Cal Guardiola (Terrassa, Vallès-Pendès Basin, Catalonia, Spain). Journal of Vertebrate Paleontology, 29 Suppl. 3: 139A-140A.

Van Dam, J.A. Abdul Aziz, H., Abels, H.A., Alcalá, L., de Boer, P.L., Hilgen, F.J. & Steensma, K. (2009) Astrochronology of the late Vallesian (middle Tortonian) mammalian record of the Teruel Basin, Spain. Acta Naturalia de "L'Atenneo Parmense", 45 (1/4): 312-313.

### Scientific dissemination publications

Furió, M. (2009) Una musaranya a Hollywood. Ictineus, 16: 5-6.

Furió, M. (2009) Una musaranya a Hollywood. Omnis Cellula, 21: 34-36.

Furió, M. (2009) Insectívors fòssils i molars tribosfèniques. Omnis Cellula, 21, 9.

Van Dam, J. A. (2009) Fossil horse teeth show climatic change. UAB Divulga Setembre.

### Technical reports

Madurell-Malapeira, J. (2009) Report on the paleontological prospection at the La Cerdanya Basin. Not published, submitted to the Archaeologyand Paleontology Service, Ministry of Culture and the Media, Generalitat de Catalunya. Entry 391E/180.

Madurell-Malapeira, J. (2009) Report on the paleontological excavation at the Incarcal site, August 2009. not Published, submitted to the Archaeology and Paleontology Service, Ministry of Culture and the media, Generalitat de Catalunya. Entry 391E/1091. 2009.

Van Dam, J. A. (2009) Report on the results of the preparation of paleontological materials at the Terol Basin (Province of Terol). Not published, submitted to the General Regional Council of Aragon, dossier DGA 242/06.

### Research projects

Consolidated Paleoprimatology Research Group (CRG) and Human Paleontology Group PIPH, directed by Prof. Salvador Moyà-Solà of the Institut Català de Paleontologia, and financed by AGAUR of the Ministry of Innovation, Universities and Enterprise of the Generalitat de Catalunya. 2009-2013.

Project "Great apes (Hominoidea) of the Miocene of the Mediterranean area: origin, evolution and paleobiology" (CGL2008- 00325/BTE), directed by Salvador Moyà-Solà, and financed by the Ministry of Science and Education. 2009-2011.

Paleontology of Vertebrates of the La Cerdanya Basin project, directed by Joan Madurell, approved by the Archaeology and Paleontology Service of the Generalitat de Catalunya, and financed by the Institut Català de Paleontologia. 2009.

Paleontology of Vertebrates of the Banyoles-Besalú Basin project 2009-2013, directed by Joan Madurell, approved by the Archeology and Paleontology Service of the Generalitat de Catalunya, and financed by the Institut Català de Paleontologia in 2009

Project "Vallès-Penedès contextual project", in the context of the RHOI (Revealing Hominid Origins Initiative), directed by Prof. T. White and financed by the National Science Foundation (NSF) (RHOIHominid- NSF-BCS-0321893). 2005-2009.

Project "Dynamics of Terrestrial Ecosystems in the Plio-Pleistocene in the basins of Spanish Levante" (CGL) directed by Jordi Agustí (IPHES, Universitat Rovira i Virgili), and financed by the Ministry of Science and Education. 2006-2009.

"Synthesys" Programme of the European Union. J. Madurell Malapeira has obtained a mobility grant for a short research tenure at the Museum for Central Africa at Tervueren (Belgium). Period of tenure: May 2009.

# *Vallparadís and Cal Guardiola (Terrassa), two of the most prolific sites of the Lower Pleistocene in Eurasia*

## Talks and posters at conferences

1) Evolutionary islands 150 years after Darwin. Leiden (Holland), 11-13 Febrer 2009. Casanovas-Vilar, I. (talk) The biogeography of the Late Miocene faunal turnover in Europe.

2) VII Encontro de Jovens Investigadores em Paleontologia (EJIP).

Torres Vedras (Portugal), 7-10 Maig 2009. Furió, M. & Santos-Cubedo, A. (talk) On fossil postcranial bones of Neogene and Quaternary insectivores (Eulipotyphla, Mammalia), with some remarks on the material from Almenara- Casablanca 1 (Castelló, Spain).

Madurell-Malapeira, J., Aurell, J., Alba, D.M., Moyà-Solà, S. (talk) The Epivillfranchian fossiliferous levels of Vallparadís (Terrassa, Barcelona, Spain).

Robles, J.M., Alba, D.M., Moyà-Solà, S. (talk) The morphology of the upper fourth premolar in Trocharion albanense Major, 1903 (Mustelidae: Leptarctinae) and the independent loss of the carnassial notch in leptarctines and other mustelids.

3) I Iberian Symposium on Geometric Morphometrics. Sabadell, 23-25 July 2009.

Van Dam, J.A. (talk) Landmark-based morphometrics of micromammal mandibles and effects of phylogeny and function: preliminary results. Institut Català de Paleontologia.

4) 13th Congress RCMNS – Earth System Evolution and the Mediterranean area from 23 Mya to the present. Naples (Italy). 1-5 September 2009.

Casanovas-Vilar, I., García-Paredes, I., Alba, D.M., Hoek Ostende, L. W. van den, Moyà-Solà, S. (talk ) The European Far West: Miocene mammal diversity dynamics in the Iberian Peninsula.

Van Dam, J.A. Abdul Aziz, H., H. A. Abels, Alcalá, L., de Boer, P.L., Hilgen, F.J. & Steensma, K. (talk) Astrochronology of the late Vallesian (middle Tortonian) mammalian record of the Teruel Basin, Spain.

5) 68th Annual Meeting Society of Vertebrate Paleontology and the 57th Symposium of Vertebrate Palaeontology and Comparative Anatomy (SVPCA). Bristol (United Kingdom), 23-26 September 2009.

Madurell-Malapeira, J., Alba, D.M., Moyà-Solà, S. (poster) Carnivora from the late Early Pleistocene of Cal Guardiola (Terrassa, Vallès-Penedès Basin, Catalonia, Spain).

Aurell, J., Madurell-Malapeira, J., Alba, D.M., Moyà-Solà, S. (poster) Small equid remains from the early Middle Pleistocene of Vallparadís (Terrassa, Barcelona, Spain).

Furió, M., Agustí, J., Mouskhelishvili, A., Sanisidro, O. & Santos-Cubedo, A. (poster) A new interpretation on the use of venom in the Plio-Pleistocene shrew Beremendia (Insectivora, Mammalia).

Agustí, J., Blain, H.-A., Furió, M., De Marfà, R. & Santos-Cubedo, A. (poster) The Late Pliocene – Early Pleistocene small vertebrate succession of the Guadix-Baza Basin (SE Spain).

## Conferences, workshops and courses

"Evolutionary islands 150 years after Darwin". Leiden (Holland), 11-13 February 2009.

"36th meeting Arbeitskreis Wirbeltierpaläontologie in der Paläontologischen Gesellschaft". Bensberg (Alemanya), 13-15 Març 2009.

"VII Encontro de Jovens Investigadores em Paleontologia (EJIP)".

Torres Vedras (Portugal), 7-10 Maig 2009.

"Evolutie van kustgebied in de Lage Landen", Symposium Dutch/ Flemish Paleobiological Circle (KNGMG). Haarlem (Holanda), 12 June 2009.

"I Iberian Symposium on Geometric Morphometrics". Sabadell, 23-25 Juliol 2009.

"13th Congress RCMNS – Earth System Evolution and the Medite ranean area from 23 Mya to the present. Naples (Italy)". 1-5 September 2009.

"68th Annual Meeting Society of Vertebrate Paleontology and the 57th Symposium of Vertebrate Palaeontology and Comparative Anatomy (SVPCA)". Bristol (Regne Unit), 23-26 September 2009.

"ESF Exploratory Workshop – Between Life and Earth Sciences. Palaeontology in a European Prespective". Limin Hersonissos (Grècia). 22-25 October.

"University Expert Course on Advanced Statistical Methods Applied to the Department of Statistics, Research Operation and Numeric

Calculation", UNED (Universidad Nacional de Educación a Distancia), 2008-2009 course.

"Introduction to Geometric Morphometrics: theorethical background and basic analytical techniques". Universitat Autònoma de Barcelona, 20-22 July 2009.

Introduction to the monitoring of populations of small mammals. Organised by the Natural Spaces Department of Barcelona Regional Council. Alberg El Puig (Montseny), 18-21 May and 1-4 September 2009.

J.A. Van Dam has participated in the organisation of the international conference "The stable isotope toolbox for fossil and sub-fossil organisms. Spring Symposium Dutch/Flemish Paleobiological Circle (KNGMG)" (Boxtel, Holland, 13 March, 2009).

I. Casanovas-Vilar has participated in the organisation of the international conference " 1st Iberian Symposium on Geometric Morphometrics" (Sabadell, 23-25 July 2009) as well as the course "Introduction to Geometric Morphometrics: theorethical background and basic analytical techniques" (Universitat Autònoma de Barcelona, 20-22 July 2009).

### Organisation and participation in paleontological Excavation

M. Furió has participated in the field and laboratory work at the Cueva Victoria (Múrcia) excavations, directed by Lluís Gibert (University of Berkeley) and Carles Ferràndez (Universitat de Barcelona). 4-8 July 2009.

J. Madurell (Director). Prospecting campaign at the la Cerdanya Basin. 20-29 May 2009. Participating group members: I. Casanovas-Vilar, M. Furió, J.M. Robles, J.A. van Dam.

J. Madurell and Bienvenido Martínez (IPHES) (Director). Excavation campaign at the Incarnal Lower Pleistocene site (Crespià el Pla de l'Estany). 2-12 August 2009. Participating group members: participaren: I. Casanovas-Vilar, J.M. Robles i C. Rotgers.

J. Van Dam and D. Ventra (Utrecht University). Magneto- and lithostratigraphic correlations the Calataiud-Daroca and Terol basins (Aragon). 24-26 May 2009.

J.Van Dam and P. De Boer (Utrecht University). Field work for cyclostratigraphic studies in the Terol basin (Arargon). 18-19 June 2009.

J. Van Dam and R. Van Balen (Vrije Universiteit, Amsterdam). Strat graphic/paleontological prospecting campaign in the La Celia area (Murcia). 19-21 June, 2009.

J. Van Dam in collaboration with Luis Alcalá and D. Pesquero (Fundación Conjunto Paleontológico de Teruel-Dinópolis). Field campaign for cyclostrategraphic studies in the Terol basin (Aragon). 7-11 Setember 2009.

J. Van Dam I. Casanovas-Vilar in collaboration with L. Alcalá and E. Espilez (Fundación Conjunto Paleontológico Teurel-Dinópolis). Prospecting and sampling campaign for cyclostratigraphy at the Terol basin (Aragon). 29 September - 2 October.

J. Van Dam in collaboration with Luis Alcalá and E. Espilez (Fundación Conjunto Paleontológico Teurel-Dinópolis). Stratigraphic/paleontological prospecting camapaign in the Terol basin (Arargon). 5-7 November.

### Conferences

VVan Dam, J. Towards a new palaeontology: scanning time, morphology and environment. Department of Earth Sciences, Utrecht University (Holland), November.

### Scientific dissemination conferences

Furió, M. The deductive method in science. Hominids and shrews fossils of Dmanisi (Georgia). IES Sales, Viladecans, Gener. Casanovas-Vilar, I. Sabadell was a forest! Casal Pere Quart, Sabadell. May.

Furió; M. Hominids and Dinosaurs: an introduction to the world of Geology and Paleontology. IES Miquel Crusafont, Sabadell, November.

Furió, M. Desclassifying Darwin. Activities included in the progra me "Science at your reach" of Science Week 2009. Sala Blava de l' Espai Tolrà, Castellar del Vallès, November.

### Teaching and courses

Casanovas-Vilar, I. and Furió, M. have taught classes in the modules "Vertebrate and Human Paleobiology " and "Fossils and geological time" of the Master's Degree in Paleontology at the Universitat Autònoma de Barcelona and the Universitat de Barcelona in the 2009-2010 course.

### Doctoral thesis committees

Furio, M. was a member of the committee of the thesis "The Soricids (Mammalia, Eulipotyphla) of the Lower Pleistocene of the Sites at la Sierra de Atapuerca, Burgos, Spain" led by Juan Rofes Chávez. 11 July 2009, Faculty of Geology, Universidad de Zaragoza.

### Awards

Joan Oró Prize (5th Edition) for the dissemination of scientific research (Catalan Association for Scientific Communication, ACCC) for the work "Una musaranya a Hollywood" ("A shrew in Hollywood"). Furió, M. 5 February 2009.

### Other activities

Casanovas-Vilar, I. has been a member of the scientific committee of the 1st Iberian Symposium on Geometric Morphometrics.

Van Dam, J. has been Assistant Editor of the Zoological Journal of the Linnean Society (SCI).

Casanovas-Vilar, I. and Furió, M. have been proofreaders for articles sent to the Zoological Journal of the Linnean Society (SCI).

Casanovas-Vilar, I. has collaborated in the capacity of advisor and consultant with Museu Límit K-T at Coll de Nargó (l'Alt Urgell) in the preparation of an exhibition hall aimed at the Cenozoic.

# 4

# Research Paleoprimatology and Human Paleontology group

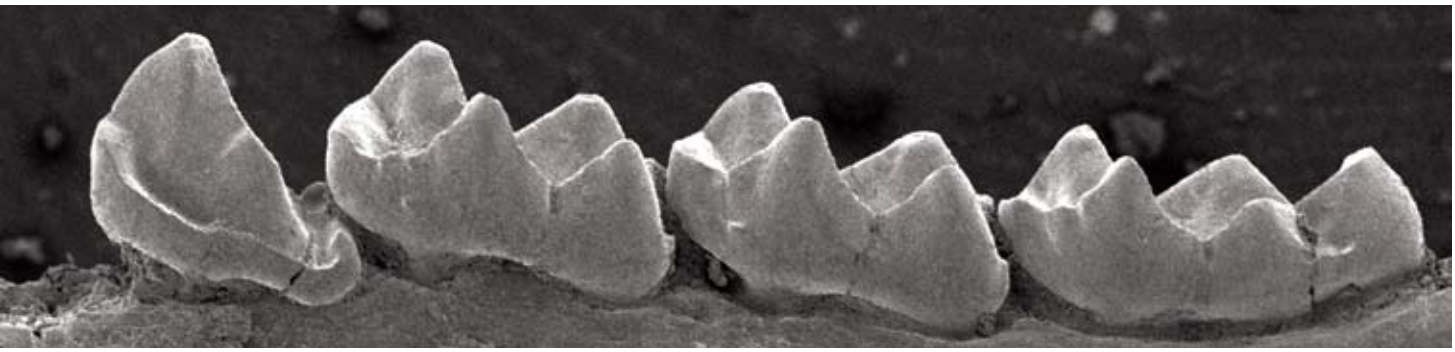
**The Paleoprimatology and Human Paleontology research group of the ICP studies the evolutionary history of humans and primates from the remains provided by the fossil record, which becomes a key piece in the understanding of biological Nature and the diversity of the human genus, as well as in obtaining information about what the ancestors of the large anthromorphs were like. This analysis enables questions to be resolved, such as the philogenetic relationship between the various species or the origin of the hominid family, which Man belongs to.**

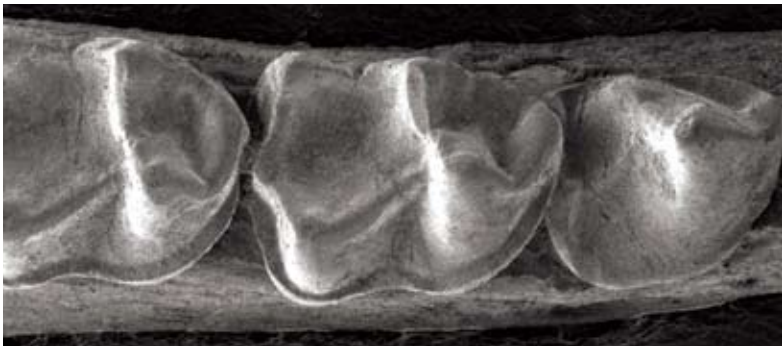
This research group is currently following various lines of research, mostly centred on the study of Pliopithecidae, Cercopithecidae and Hominoid primates.

The members of the Human Paleoprimatology and Paleontology team study the fossils from 3 perspectives: the taxononomic, based on describing genera and species; the phylogenetic, which analyses the origin and relationship between the various groups; and the paleobiological, centred on the evolution of biological aspects, such as locomotor adaptations and changes in physiological traits, the maturation and longevity processes of individuals, as well as cognitive capacities based on encephalic volume.

The oldest known homoinoid genus is the Proconsol, which lived during the Lower Miocene. There are currently a variety of theories on how the Miocene hominoides spread towards Europe and on the origin of the plurality of forms which appeared in Asia and the Old Continent. However, it is known that the origin of the Proconsol genus is located at the Rusinga (Kenya) sites and in Uganda.

The Proconsol is characterised by mixed behaviour, with quadruped (i.e., surface-dwelling) and tree-dwelling traits. At the same time it presented a combination of Mico and anthropoid characteristics, such as fine ankles (similar to those of the Mico) and robust big toes or direct articulation between wrist and cubitus (like the anthropoids). As regards the Proconsol's cranial capacity, this fluctuated between 154 and 180 cubic cm.





Catalonia is the region with the most prolific Miocene primate sites in Europe. The unique geological characterisitics of the area enable good preservation and greater density of fossil remains, since the the sedimentation rates are very high. The Abocador de Can Mata (ACM) in the Barcelona region locality of Els Hostalets de Pierola, is one of the most important sites for finding fossil primates. In 2002, the Català de Paleontologia discovered at the Abocador de Can Mata remains of a new hominoid with an antiquity of 13 million years, which was named Pieralophitecus catalaunicus, popularity known as Pau.

The importance of this find lies in the fact that Pau fulfils the characteristics necessary to be considered a common ancestor of today's great apes and humans, as he has an infinite combination of human and Mico traits. Weighing 35 kg and 1.20 m tall, Pierolaphitecus had short hand- and foot bones like those of the Micos, which enabled it to climb trees. In contrast, the shoulder blades were positioned alonside the backbone (a position that confers better rotation of the arms), as present-day humans have. humans. In contrast to the Micos, the thoracic box of the Pierolapithecus is wider and flatter, and in relation to the cranium, the nasal structure did not intefere with the field of vision.

Can Mata has subsequently provided, through the ICP, a new species of primate, which lived 12 million years ago in the Anoia region of Catalonia. Anoiapithecus brevirostris, popularly known as Lluc. The most outstanding feature of Anoiapithecus is its facial morphology, with a small snout. This aspect is characteristic of the Homo genus, meaning that it can be treated as a case of evolutionary convergence. Lluc has a wide nasal opening, a deep palate cavity and a flat or "brief" face, as its name (brevirostris) indicates, typical features of the large hominoides. Nonetheless, it also presents primitive traits, such as a strong jaw and thick tooth enamel.

Recently, the ICP team has discovered a new species of primate at the ACM, based on dental pieces and the jaw bone - Pliophitecus canmatensis. It is believed that it emerged from the African continent and that it spread to Eurasia and later to Europe. It has been inferred from the fossil remains that Pliopithecus canmatensis fed essentially on fruit, lived in the branches of trees and weighed approximately 15 kg. This new primate is the ancestor of the hominins of the end of the Pilocene and Lower Pleistocene.

The constant discoveries of sites and fossil remains of apes in Catalonia has led to the creation of the SOMHI project (Searching for the Origins of Modern Hominoides Initiative). This is a team of researchers who concentrate on the sites at the localities of Masquefa, Esparreguera and Piera (Barcelona). The SOMHI project is made up of the Institut Català de Paleontologia team, the Stratigraphy Department of the Barcelona University , the Department of Anthropology of the Universitat Autònoma de Barcelona and Paleotheria, SCP company.

The SOMHI project in turn forms part of the RHOI initiative (Revealing Hominid Origins Initiative), aimed at researching the origin and evolution through time of the hominids in the period of 5 to 7 million years ago. This is an interdiscplinary and international initiative directed by the University of Berkeley, California. 15 countries currently participate and there are a total of 33 paleontological projects underway.

The Paleoprimatology and Human Paleontology group of the ICP carry out 4 lines of research - anatomy of the hand of hominoides, fossil primates of the Neogene, Miocene hominoides and fossil prosimians of the Eocene – lines which make up an extraordi- nary research task and which contribute to shedding light on the evolution of various primates and on the origin of our species.

## Brief Annual Summary

Excavation and prospecting: during 2009, processing was undertaken of macrovertebrate fossil remains recovered during the emergency paleontological operations carried out at the Abocador de Can were processed Mata (Middle Miocene), the Can Mata Ecoparc (Upper Miocene) and the B-40 Barcelona Orbital Motorway at Viladecavalls (Upper Miocene).

Prospecting has also been done at the La Cerdanya Basin, (Alp, Bellver, Bolvir, Das, Fontanals, Ger, Isòvol, Lles, Meranges, Prats, Prullans, Riuand Urús) looking for new paleontological sites of the Neogene.

Geology and magnetostratigraphy: the principal new results in this field refer to the publication of the magnetostratigraphy of the Abocador de Can Mata series (Moyà-Solà et al., 2009a; Alba et al., 2009c), as well as the publication of the new stratigraphic sequence of Vallesià at the B40, in the Viladecavalls area. This latter, together with the new fossil finds produced in the area, will in the future improve the dating and contextualisation of fauna at the previous fossil primate finds at localities in this area, such as La Tarumba (typical location of Hispanopithecus Laietanus).

Results have meanwhile been published on astrochronology of the Upper Vallesian and on the relationship between paleoclimatic cycles (Van Dam et al., 2009) and evolution of the body mass (Troost et al., 209).

Studies on primates and fosil hominids: with regard to the hominids, during 2009 the previously unpublished remains of Dryopithecus fontani at the Abocador de Can Mata were described (Moyà-Solà et al., 2009a). These constitute the first facial remains known of this taxon, as well as the phalanges of Pierolapithecus Catalaunicus (Almécija et al., 2009a,b; Alba et al.), which provide essential information on the evolution of the locomotive apparatus of the hominoides.

A new genus and species of this abovementioned group has likewise been described (Moyà-Solà et al., 2009b), Anoiapithecus Brevirostris, which sheds light on and confirms the great variety of homonoides in existence during the Middle Miocene in the Western Mediterranean area.

occidental. Other works related to the evolution of the primates include the description of a new species of pliopithecidae primate of the Abocador de Can Mata (Alba et al., 2009a), taxonomic and biomechanical studies of adapid and homonid primates of the Iberian Peninsula (Marigó et al., 2009a,b, under review; Minwer-Barakat et al., under review; Roig et al., 2009), a review on the origin of the clade of the large anthromporph apes and humans based on the new discoveries at the sites at Vallès-Penedès (Alba & Moyà-Solà, 2009; Alba et al., 2009d). Cognitive inferences have also been produced on fossil primates based on encefalisation (Alba, in printing) and the study of the hand of the Olduvai OH7 hominid (Almécija et al., 2009 c).

Finally, during 2009 2 Master's Degree works were supervised on fossil primates in Catalonia (Marigó, 2009; Susanna López, 2009). Similarly, during this year a summary was published (Alba et al., 2009b) and a manuscript sent (Alba et al.) which describes the thickness of the dental enamel of the fossil hominoids of the Abocador de Can Mata.

Acquisition and 3D modelling of fossil specimens: with the aim of illustrating some of the articles published during 2009, three-dimensional models have been used, produced by means of an optical scanner (Alba et al.) At the same time, data obtained using Computerized Axial Tomography (CAT) of the crania of Pierolapithecus and Anoiapithecus have been published in Moyà-Solà et al. (2009b).

During 2009, the results of the research project were made known through publication in numerous scientific journals and through international conferences. Among the journals in which they were published, mention should be made of those with a high impact factor on the Science Citation Index (SCI), such as Proceedings of the National Academy of Sciences USA, American Journal of Physical Anthropology, Journal of Human Evolution and Journal of Vertebrate Paleontology.

### Articles published in journals of the Science Citation Index (SCI)

Almécija, S., Alba, D.M. & Moyà-Solà, S. (2009) Pierolapithecus and the functional morphology of Miocene ape hand phalanges: paleobiological and evolutionary implications. Journal of Human Evolution, 57: 284-297.

Badiola, A., Checa, L., Cuesta, M.A., Quer, R., Hooker. J.J. & Astibia, H. (2009) The role of new Iberian finds in understanding European Eocene mammalian paleobiogeography. Geologica Acta, 7, 243-258.

Freudenthal, M., Martín Suárez, E., Gallardo, J. A., García-Alix, A., & Minwer-Barakat, R. (2009) The application of correspondence analysis in Palaeontology. Comptes Rendus Palevol, 8 (1): 1-8.

García-Alix, A., Minwer-Barakat, R., Martín, J.M., Martín-Suárez, E. & Freudenthal, M. (2009) Dating the change from endoreic to exoreic conditions in the drainage system of the Granada Basin. Palaios, 24(8):544–549.

García-Alix, A., Minwer-Barakat, R., Martín-Suárez, E. & Freudenthal, M. (2009) Small mammals from the Early Pleistocene of the Granada Basin (Southern Spain). Quaternary Research, 72:265–274

Minwer-Barakat, R., García-Alix, A., Agustí, J., Martín-Suárez, E. & Freudenthal, M. (2009) The micromammal fauna from Negratín-1 (Guadix Basin, Southern Spain): new evidence of African-Iberian mammal exchanges during the Late Miocene. Journal of Paleontolgy, 83(6):854-879

Minwer-Barakat, R., García-Alix, A., Martín-Suárez, E. & Freudenthal, M. (2009) Late Turolian micromammals from Rambla de Chimeneas- 3: considerations on the oldest continental faunas from the Guadix Basin (Southern Spain). Neues Jahrbuch für Geologie und Paläontologie Abhandlungen, 251(1):95-108.

Moyà-Solà, S., Köhler, M., Alba, D.M., Casanovas-Vilar, .I, Galindo, J., Robles, J.M., Cabrera, L., Garcés, M., Almécija, S. & Beamud, E. (2009) First partial face and upper dentition of the Middle Miocene hominoid Dryopithecus fontani from Abocador de Can Mata (Vallès-Penedès Basin, Catalonia, NE Spain): taxonomic and phylogenetic implications. American Journal of Physical Anthropology, 139:126-145.DOI: 10.1002/ajpa.20891.

### Articles published in non-SCI journals

Alba, D.M. & Moyà-Solà, S. (2009) The origin of the great-ape-andhuman clade (Primates: Hominidae) reconsidered in the light of recent hominoid findings from the Middle Miocene of the Vallès-Penedès Basin (Catalonia, Spain). Paleolusitana, 1: 75-83.

Alba, D.M., Casanovas-Vilar, I., Moyà-Solà, S., Garcés, M., Robles, J.M., Cabrera, L. & Galindo, J. (2009). Recent discoveries of Middle Miocene hominoides from the Vallès-Penedès Basin (Catalonia, Spain) and their implications for understanding the early radiation of great apes in the Mediterranean region [Abstract]. Acta Naturalia de L´Ateneo Parmense, 45: 237-239.

Alba, D.M., Roble,s J.M., Rotgers, C., Casanovas-Vilar, I., Galindo, J., Moyà-Solà, S., Garcés, M., Cabrera, L., Furió, M., Carmona, R, & Bertó Mengual. J.V. (2009) Middle Miocene vertebrate localities from Abocador de Can Mata (els Hostalets de Pierola, Vallès-Penedès Basin, Catalonia, Spain): An update after the 2006-2008 field campaigns. Paleolusitana, 1: 59-73.

Almécija, S., Alba, D.M. & Moyà-Solà, S. (2009) OH 7, the curious case of the original handy man? Paleolusitana, 1: 85, 90 -92

Marigó, J., Minwer-Barakat, R., Moyà-Solà, S. & Roig, I. (2009) Middle Eocene primates from Mazaretón (Almazán Basin, Soria): preliminary report. Paleolusitana 1: 257-260.

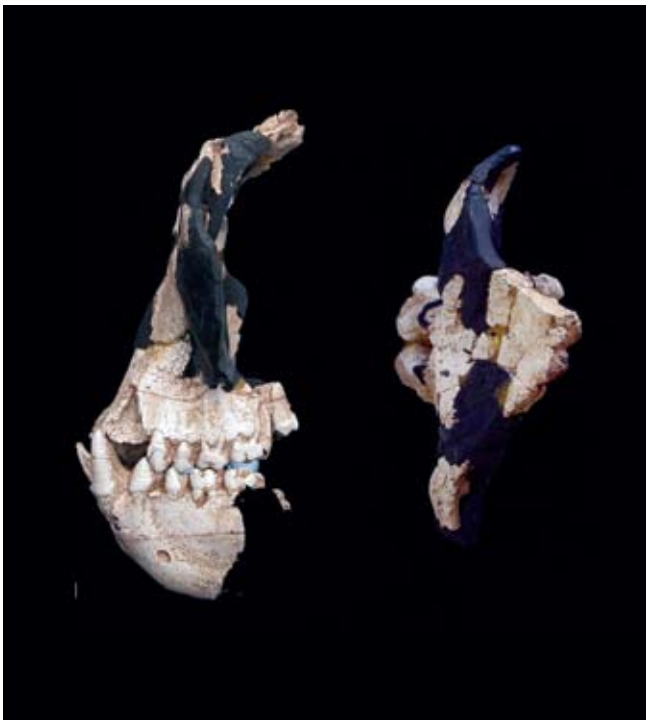
Roig, I., Moyà-Solà, S., Köhler, M., Alba, D.M., Minwer-Barakat, R. & Marigó, J. (2009) Locomotor inferences in Anchomomys Stehlin, 1916 (Primates, Adapidae) on the basis of calcaneal proportions. Paleolusitana 1: 419-423

### Articles published in national journals

Alba, D.M., Tarruella, A., Prats, L., Corbella, J. & Guillén, G. (2009) A new species of Guadiella Boeters, 2003 (Neotaenioglossa: Rissooidea: Hydrobiidae) at the Font del Racó de la Pastera (Ulldemolins, el Priorat, Catalunya, Spain). Spira, 3: 1 - 12.

Alba, D.M., Tarruella, A., Guillén, G., Prats, L. & Corbella, J. (2009). New data on Moitessieria seminiana Boeters, 2003 (Neotaenioglossa: Rissooidea: Moitessieriidae) on the basis of material from Fuente del Cerezo (Maleján, Zaragoza, Spain). Spira, 3: 109-115.

Moyà-Solà, S. (2009) Preface. In: De Estaban Trivigno, S., Casanovas- Vilar, I., Martín Pérez, C., Almécija, S. & Marigó, J. (Eds.) I Iberian



Symposium on Geometric Morphometrics. Paleontology and Evolution, Mem. Esp. 3: 5-6.

Tarruella, A., Quintana, J., Alba, D.M. & Prats, L. (2009) First citation of Macrogastra (Pyrostoma) attenuata lineolata (Held, 1836) (Gastropoda: Clausiliidae) for Iberian malacofauna. Spira, 3: 13-25..

### Scientific dissemination articles

Alba, D. M., Vila, B. & Ruiz, H. (2009) Feathered dinosaurs. The ancestors of the birds. Eureka, 17:6-1.

Vila, B. & Alba, D. (2009). Feathers, dinosaurs and birds: which came first, the feather or the bird? Omnis Cel·lula 20: 10-15..

### Proceedings

Alba, D.M., Casanovas-Vilar, I., Moyà-Solà, S., Garcés, M., Robles, J.M., Cabrera, L. & Galindo, J. (2009) Recent discoveries of Middle Miocene hominoids from the Vallès-Penedès Basin (Catalonia, Spain) and their implications for understanding the early radiation of great apes in the Mediterranean region [Abstract]. Acta Naturalia de "L'Ateneo Parmense, 45: 237-239.

Alba, D., Fortuny, J. & Moyà-Solà, S. (2009) Relative enamel thickness in Middle Miocene hominoids from Abocador de Can Mata (Vallès-Penedès Basin, Catalonia, Spain) [Abstract]. Journal of Vertebrate Paleontology, 29 Suppl. 3: 52A-53A. Almécija, S., Alba, D. & Moyà-Solà, S. (2009) Pierolapithecus, Hispanopithecus and the evolution of positional behavior in Miocene apes: perspectives from the hand [Abstract]. Journal of Vertebrate Paleontology, 29 Suppl. 3: 53A.

Aurell ,J. & Fortuny, J. (2009) Computed Tomography vs. mechanical cutting: How to play Doctor House with fossil teeth. I Conservation Workshop, Sabadell.

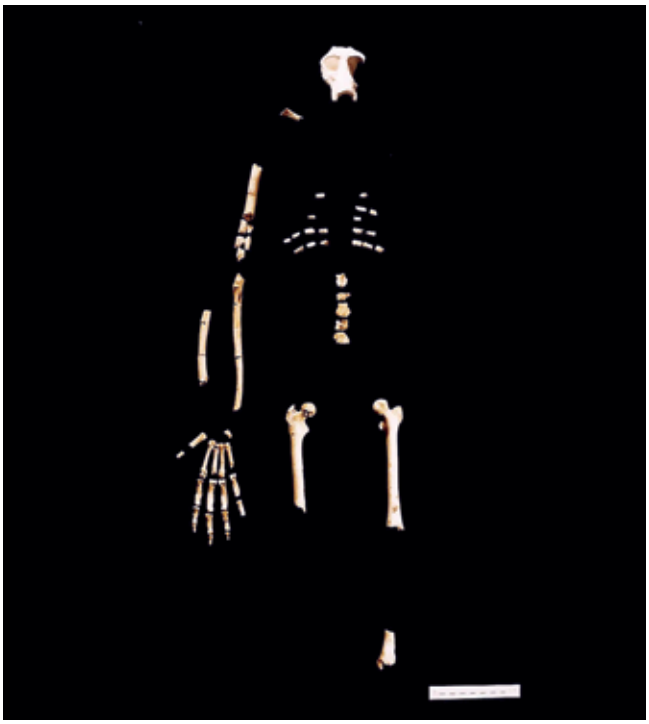
Aurell-Garrido, J., Madurell-Malapeira, J., Alba, D. & Moyà-Solà, S. (2009) Small equid remains from the early Middle Pleistocene of Vallparadís (Terrassa, Barcelona, Spain). Journal of Vertebrate Paleontology, Suppl. 3, 57A.

Marigó, J., Minwer-Barakat, R., Moyà Solà, S. & Cuesta, M. (2009) A new genus and species of Adapidae (Mammalia, Primates) from the Middle Eocene of Mazaterón (Almazán Basin, Soria, Spain) [Abstract]. Journal of Vertebrate Paleontology, 29 Suppl. 3: 142A.

Moyà-Solà, S. & Köhler, M. (2009) Processes and patterns: the punctuated equilibrium versus phyletic gradualism debate in the light of insular evolution. International symposium on islands and evolution (14th-17th september 2009, Maó Menorca, Spain). P.70..

### Conferences

- 68th Annual Meeting Society of Vertebrate Paleontology, 57th Symposium of Vertebrate Palaeontology and Comparative Anatomy (SVPCA). (Bristol, 23-26 September 2009),
- 13th Congress RCMNS: Earth System Evolution and the Mediterranean area from 23 Ma to the present (Naples, September 2009)
- Evolutionary Islands 150 years after Darwin. (Leiden, 11-13 February 2009).
- VII Encontro de Jovens Investigadores em Paleontologia (EJIP). Torres Vedras (Portugal), 7-10 May 2009.



*The group forms part of the SOMHI project, included in the RHOI initiative of the University of Berkeley (California)*

Madurell-Malapeira, J., Aurell, J., Alba, D.M. & Moyà-Solà, S. (talk) The Epivillafranhian fossilferous levels of Vallparadís (Terrassa, Barcelona, Spain).

Robles, J.M., Alba, D.M. & Moyà-Solà, S. (talk) The morphology of the upper fourth premolar in Trocharion albanense Major, 1903 (Mustelidae: Leptarctinae) and the independent loss of the carnassial notch in leptarctines and other fossils.

Alba, D.M., Robles, J.M., Rotgers, C., Casanovas-Vilar, I., Galindo, J., Moyà-Solà, S., Garcés, M., Cabrera, L., Furió, M., Carmona, R., Bertó Mengual, J.V. Middle Miocene vertebrate localities from Abocador de Can Mata (els Hostalets de Pierola, Vallès-Penedès Basin, Catalonia, Spain): An update after the 2006-2008 field campaigns.

Alba, D.M. & Moyà-Solà, S. The fòssil of the great-ape-and-human clade (Primates: Hominidae) reconsidered in the light of recent hominoid findings from the Middle Miocene of the Vallès-Penedès Basin (Catalonia, Spain).

Almécija, S., Alba, D.M. & Moyà-Solà, S. OH7, the curious case of the original handy man?

Roig, I., Moyà-Solà, S., Köhler, M., Alba, D.M., Minwer-Barakat, R., Marigó, J. Locomotor inferences in Anchomomys Stehlin, 1916 (Primates, Adapidae) on the basis of calcaneal proportions.

Marigó, J., Minwer-Barakat, R., Moyà-Solà, S. & Roig, I. (2009). Middle Eocene Primates from Mazaterón (Almazán Basin, Soria).

- 13th Congress RCMNS – Earth System Evolution and the Mediterranean fossil from 23 Ma to the present. Naples (Italy). 1-5 September 2009.

Alba, D.M., Casanovas-Vilar, I., Moyà-Solà, S., Garcés, M., Robles, J.M., Cabrera, L. & Galindo, J. Recent discoveries of Middle Miocene hominoids from the Vallès-Penedès Basin (Catalonia, Spain) and their implications for understanding the early radiation of great apes in the Mediterranean region.

- 68th Annual Meeting Society of Vertebrate Paleontology and the 57th Symposium of Vertebrate Palaeontology and Comparative Anatomy (SVPCA). Bristol (United Kingdom), 23-26 September 2009.1 3

Alba, D., Fortuny, J. & Moyà-Solà, S. (2009). Relative enamel thickness in Middle Miocene hominoids from Abocador de Can Mata (Vallès-Penedès Basin, Catalonia, Spain).

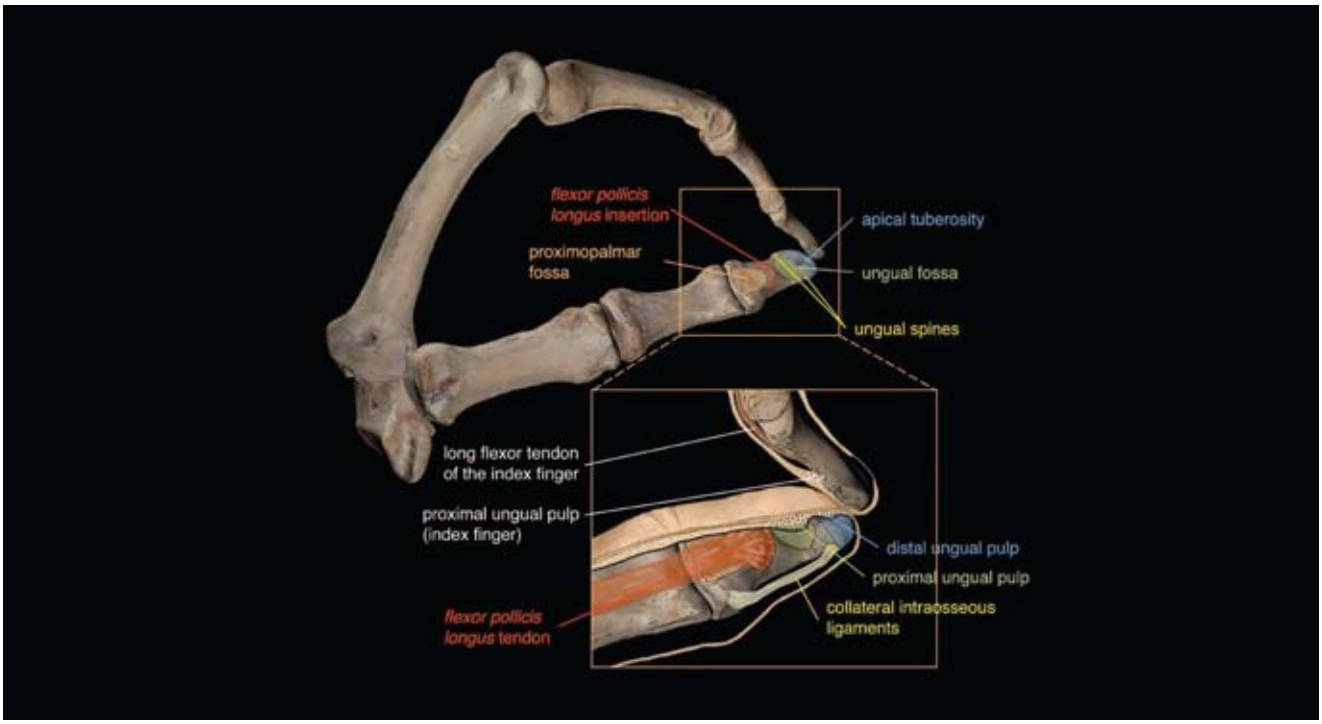
Almécija, S., Alba, D. & Moyà-Solà, S. (2009). Pierolapithecus, Hispanopithecus and the evolution of positional behavior in Miocene apes: perspectives from the hand.

Marigó, J., Minwer-Barakat, R., Moyà-Solà, S. & Cuesta, M. (2009). A new genus and species of Adapidae (Mammalia, Primates) from the Middle Eocene of Mazaterón (Almazán Basin, Soria, Spain).

- International symposium on fossil and evolution ( 14th-17th september 2009, Maó, Menorca, Spain). Moyá-Solá, S. Chairman of the Late Insular Evolution fossil.

### External relationships maintained during 2009

Research at the ICP is networked in collaboration with other research institutes, both national and international. Below is the list of collaborations that have taken place both in a common research project and in specific publications. concretes.




- Human Evolution Research Center, Department of Integrative Biology / Museum of Vertebrate Zoology University of California, Berkeley, 3060 Valley Life Sciences Building, Berkeley (USA). aquest institut col·laborem, mitjançant el projecte RHOI: Revealing Hominid Origins Initiative, funded per NSF-USA, international and multi-disciplanry initiative, aimed at illuminating the origin and initial evolution of the Hominidae family.
- Dipartimento de Paleontologia Universita di Firenze. Dipartimento di Scienze della Terra Università di Firenze, via G. La Pira, 4, Firenze (Italy)). We collaborate closely with this department in studying fossil primates of the European continent, and especially Oreopithecus bambolii, an isolated endemic hominoid of Tuscany. The works are structured in the framework of the project "Great apes (Hominoidea) of the Miocene of the Meditattanean area: origin, evolution and paleobiology". HOPE. IP: S. Moyà-Solà, Ministry of Education and Science, CGL2006- 04548/BTE. 2008-2011.
- Department of Paleontology and Stratigraphy, University of Granada. We collaborate in the study of faunas of the Neogene and Quaternary and the basins in the south of the Iberian Peninsula. (Minwer-Barakat, R.; García-Alix, A., Martín Suárez, E. & Freudenthal, (Minwer-Barakat, R.; García-Alix, A., Martín Suárez, E. & Freudenthal, E. & Freudenthal, M., (2009) The micromammal fauna from Negratín- 1 (Guadix Basin, Southern Spain): new evidence of African- Iberian mammal exchanges during the Late Miocene, Journal of Paleontology, 83(6): 854-879.
- Department of Human Biology, Universitat Autònoma de Barcelona (Barcelona). Dr. A. Malgosa. The Primatology and Human Paleontology Group has collaborated in the study of some fossil primates.

### Committees of doctoral theses, research works, Master's Degrees or dissertations

Moyà-Solà, S. Member of the Doctoral Thesis Committee of Daniel de Miguel Cascán "Functional morphology and biomechanics of the dentition in ruminants (Mammalia, Artiodactyla). Application of dental wear in the paleoenvironmental reconstruction of the Miocene of the Iberian Ridge" .University of Saragossa. February 2009.

Moyà-Solà, S. Member of the Doctoral Thesis Committee of Sergi Almécija " Evolution of the hand in Miocene apes: implications for the appearance of the human hand". Universitat Autònoma de Barcelona. Faculty of Biological Sciences 30 October 2009.

### Teaching

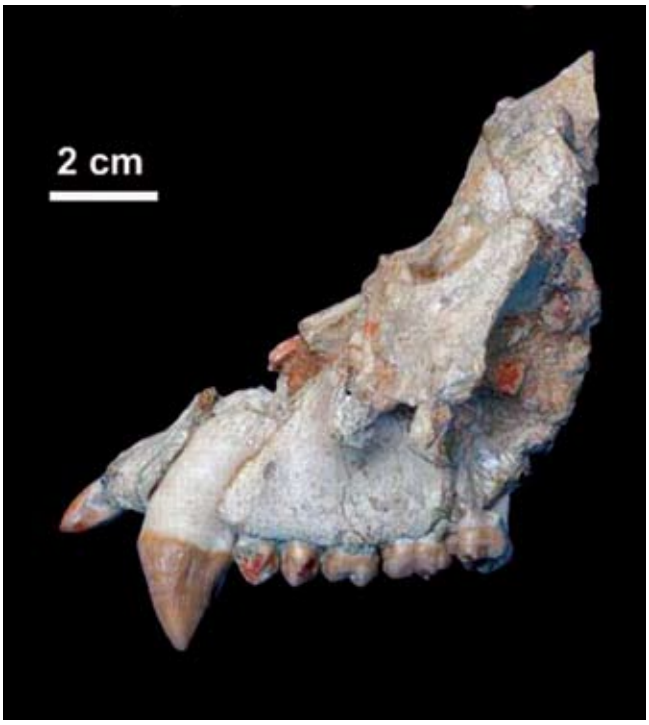
Master's Degree in Human Biology. UB-UAB. January and February 2009. Faculty of Biology of the UB. Köhler, M. & Moyà-Solà, S.

Primatology course at Barcelona Zoo. Biomechanics and locomotion of the primates. Moyà-Solà, S.

Coordinator of the Vertebrate and Human Paleontology Module of the Master's Degree in Paleontology at the Universitat Autònoma de Barcelona and Barcelona University: courses 2008-2009 and 2009-2010. Alba, D.M.

Doctorate in Geology Study Commission at the Universitat Autònoma of Barcelona: courses 2008-2009 and 2009-2010. Alba, D.M. (Member of the Committee).

Assessment committee for the works in the Master's Degree in Paleontology of the Universitat Autònoma de Barcelona and




Barcelona University: September 2009. Alba, D.M. (Member of the Committee).

Committee for the following dissertations in the Doctorate in Geology Study at the Universitat Autònoma de Barcelona: Arnau Bolet (September 2009) and Rodrigo Gaete (September 2009). Alba, D.M. (Member of the Committee). Classes taught in the Master's Degree in Paleontology of the Universitat Autònoma de Barcelona and Barcelona University, in the Vertebrate and Human Paleontology Module: courses 2007-2008 and 2008-2009. Moyà-Solà, S. & Alba, D.M. Classes taught in the Master's Degree in Human Biology and the Master's Degree in Primatology of the Universitat Autònoma de Barcelona and Barcelona University, in the Human Evolution Module: course 2008-2009. Moyà-Solà, S. & Alba, D.M.

### Master's Degree Works Supervised (course 2008-2009)

Marigó, J. (2009). A new Anchomomyini (Adapidae, Primates) from the Mazaterón Middle Eocene fossil site (Almazán Basin, Soria, Spain). 37 pages. Directors: Moyà-Solà, S. Carmona, R. (2009). Miocene snake fossils from Abocador de Can Mata (els Hostalets de Pierola, Vallès-Penedès Basin, Catalonia, Spain). 28 pp. Directors: Alba, D.M.

Luján, A.H. (2009). First cranial remains of Cheirogaster cf. Richardi Bergounioux, 1938 (Testudines: Testudinidae) of the Middle/Upper Miocene of Ecopark 4 (Els Hostalets de Pierola, Vallès-Penedès basin, Catalonia, Spain). 77 pages. Directors: Alba, D.M. Susanna López, I. (2009). Morphofunctional and morphometric study of the lumbar vertebrae of Pierolapithecus catalaunicus (Primates: Hominidae): paliobiological implications. 41 pages. Directors: Alba, D.M.

### Scientific dissemination conferences

Moyà-Solà, S. Conference in the cycle of conferences "Darwin Year: Paleontology and Evolucion". Sabadell, 22 October 2009. Organized by Sabadell University (2009 edition) at the Sabadell Fair.

Alba, D.M. Conference in the cycle "Darwin Year in Girona". Girona, 3 November 2009. Organised by the Genetics Department, Girona University in the Mercè Cultural Centre. Contribution: Alba, D.M., The origin of the Hominidae family in Catalonia: in Pau and in Lluc..

### Contribucions to the Institut Català de Paleontologia blog

Alba, D.M. The Dechronization of Sam Magruder: the novel by George Gaylord Simpson. May 2009.

Alba, D.M. UAB Divulga. The Catalan ancestors of Macaca sylvanus. February 2009.

Alba, D.M. "The hominids of Can Mata". Collaboration in video reportage.

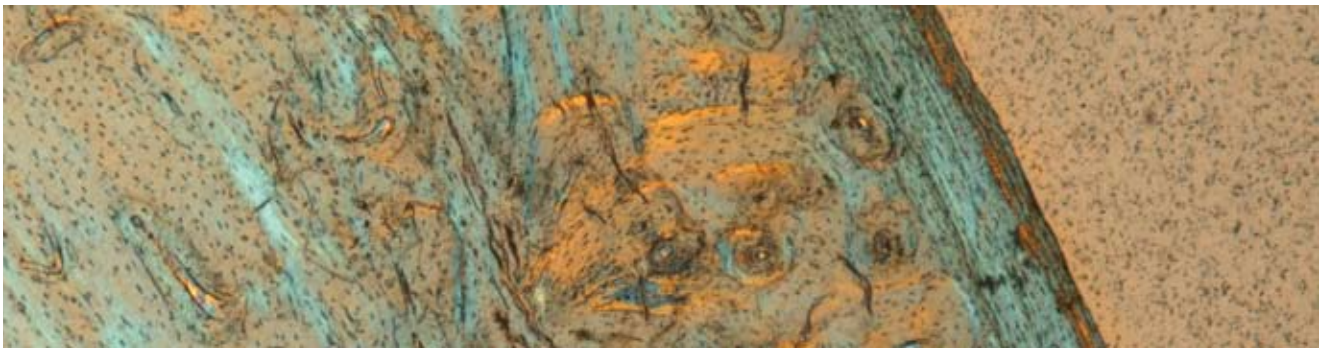
# 5 Research Paleobiological Group

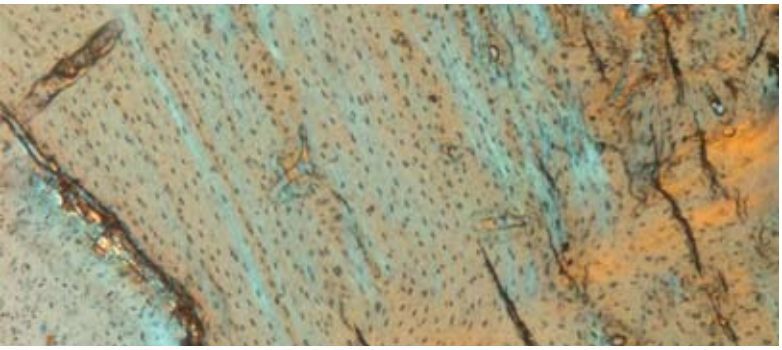
**Paleobiology is a modern branch of paleontology which analyses biological aspects of organisms of the past using the theory corpuses of biology and ecology. The Paleobiology Department of the ICP works with techniques and disciplines such as biomechanics, tridimensional analyses, CT-scans, functional morphology, ontogenetic studies or paleoecology. These tools permit approximation to fundamental biological and ecological parameters of the organisms and ecosystems that are the subject of study.**

The aim of Paleobiology is to define the selective pressures and the evolutionary dynamics of populations, taking into account physiological and corporal aspects and the life-history of each animal. Thus, this branch of science examines growth rates and longevity of the fossil communities, locomotion, thermoregulation and behaviour of the vertebrates, the effect of the various ecosystems on the evolution of some species and investigates the diverse factors of extinction, among others.

The Paleobiology Department of the ICP principally studies mammals that populated ecosystems with limited resources, a typical condition of isolated environments, such as islands, caves or mountain-tops. On this point, insular ecosystems are very interesting, as they provided little competition between species and there was a lack of predators. At the same time, the scarcity of resources meant that island animals had to reduce their energy output, a circumstance which led to morphological, physiological, metabolic, reproductive and behavioural changes.

One of the most significant species for Paleobiology is Myotragus balearicus. This is a mammal of the sub-family Caprinae, very common on the Balearic Islands, which became extinct 5000 years ago. This type of goat had unique traits as a consequence of an prolonged process of evolution in isolated conditions.





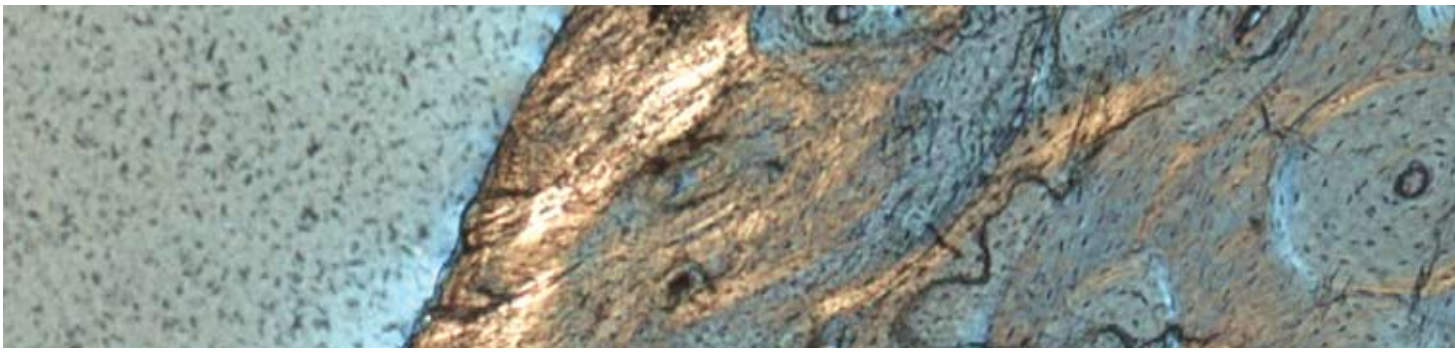
*Paleobiology defines the selective pressures and evolutionary dynamics of organisms*

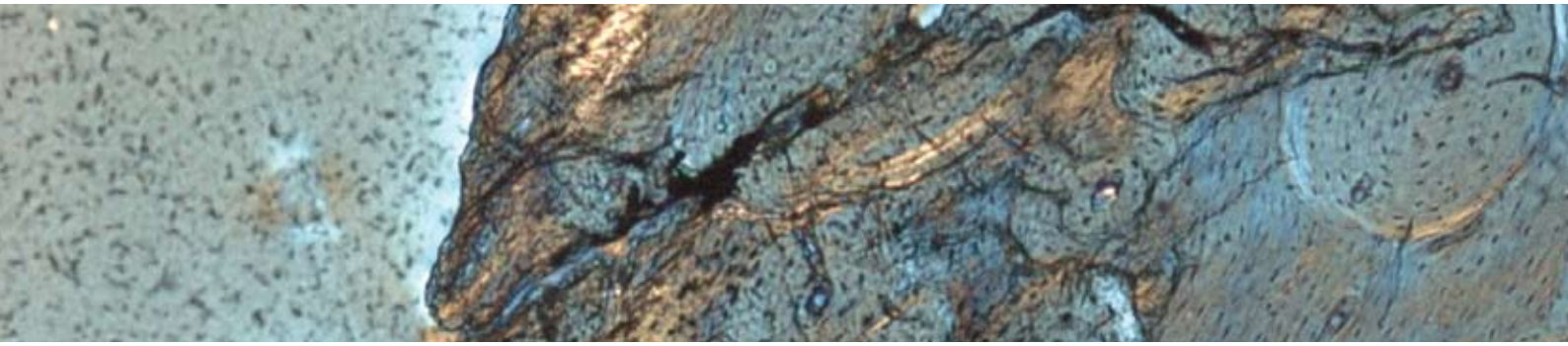
The Myotragus presented insular nanism, i.e. a small body size with a height of 50 cm and a weight that fluctuated between 12 and 15 kg. It has also been inferred that it could not have been very fast, since it had very short legs that were less flexible than those of other specimens of the same family, as a consequence of the absence of predators. In contrast to the rest of the bovids, the eyes of the Myotragus occupied a frontal position instead of a lateral one, giving them stereoscopic vision.

However, without doubt the most striking discovery has been the detection of growth rings in the bones of this goat. Lines or rings of arrested growth (LAGs) o anells de creixement aturat (en anglès Lines of Arrested growth are typical in ectothermic or cold-blooded animals such as crocodiles. LAGs appear as a consequence of slow or nil growth stages in cold-blooded species, in contrast to warm-blooded animals, whose bones regenerate continuously.

The body temperature of the Myotragus could vary as with reptiles, and regarding its metabolism, this goat could slow its growth and delay its sexual maturity to 12 years in order to live longer during periods of scarcity of food. This circumstance is surprising, bearing in mind that the domestic sheep reaches sexual maturity at around six years old.

It is for this reason that the Myotragus had a very small brain, half the size that corresponding to an animal of its size, since it is an organ that consumes many resources.





**Brief Annual Summary**

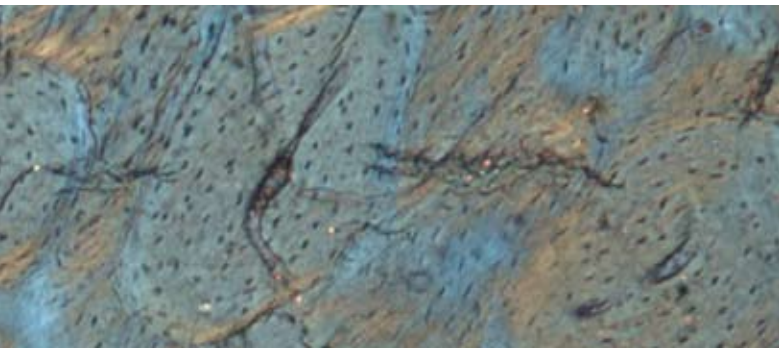
## Thin sections laboratory

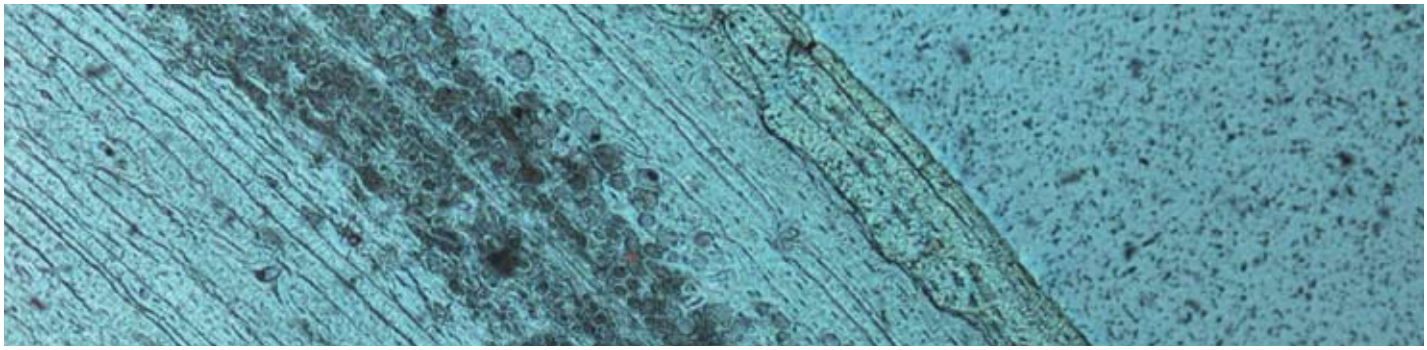
A protocol has been established for producing thin bone sections, consisting of embedding the bone in epoxy resin, obtaining a cross-section with values of between 200100 µm thick, using a diamond cutter, and finally polishing the surface with carborundum.

In June 2009, histological sections of dental pieces were also begun to be produced histològiques de peces dentals. For this purpose, the thin section was dehydrated, a histological clarifier was applie (Histoclear) and mounted in the DPX medium. This treatment has been successfully applied to the other bone section films and has been incorporated into the normal working protocol .

During 2009, the thin sections laboratory produced more than 450 thin sections of long bones, jaws and teeth with fossil and present-day material. There stand out:

- Myotragus
- Eliomys quercinus
- Glis glis
- Hypnomys
- Tragoportax gaudryi
- Gazella borbonica
- Leptobos sp
- Euprox dicranoceros
- Croizetoceros ramosus
- Crocodylia
- Nuralagus rex
- Armadillo
- Present-day ovicaprids





### Macaca majori

Pert of the fossil material required prior preparation for studying in histology or for use as comparative samples. For this reason, work was done in conjunction with the the Preparation- Restoration workshop. Thus the organic remains were almost totally eliminated. Next, each sample was registered on a database, noting the main characterisitics and sizes, with supplementary photographs.

### Bone histology of glirids (dormice)

Vertebrate life history strategies can remain recorded in their teeth and bones. This is why bone histology has become an important tool for reconstructing some of the parameters of the life history of present-day and and fossil vertebrates.

208 histological sections of long bones of present-day and fossil glirids have been produced, of the species Eliomys quercinus, Glis glis, Hypnomys. The first results obtained have been very satisfactory and hopeful, since there has been proof of the presence of Lines of Arrested growth (LAGs) in the bones of these specimens. This allows parameters to be estimated for their life history and differences between present-day glirids and fossils to be determined, as well as between the continental and insular glirids.

### Bone histology of cervids and bovids of the Miocene

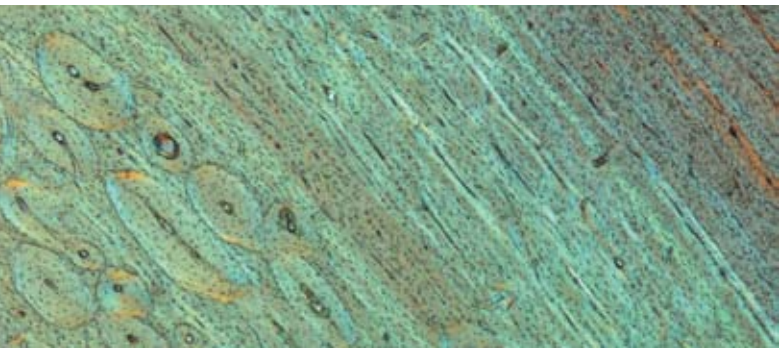
Among the mammals there is a great variety of development patterns. For example, in a great number of primates and carnivores, the primary bone tissue is rapidly replaced by Haversian bone (secondary tissue). These replacement impedes the interpretation of onogenetic changes in these mammals once they reach adulthood. In contrast, the microstructure of bone tisue of a variety of bovid and cervid species may last its entire existence due to a lesser longevity. This circumstance makes it possible to determine the histological pattern on the adult bone of fossils of the Upper Miocene of both families.

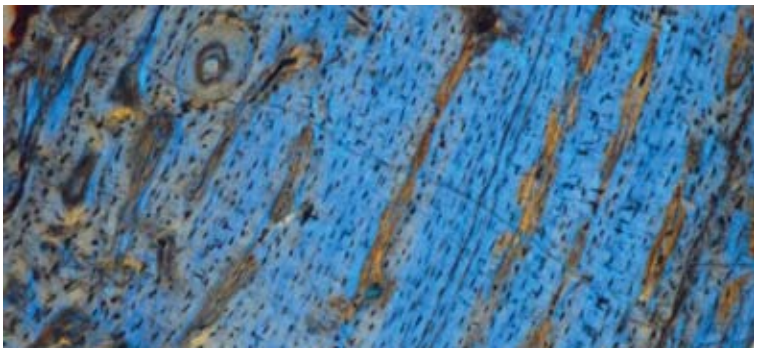
### Bone histology of primates

Analysis has been undertaken of two samples belonging to a fossil species of Macaca majori from the Plio-Pleistocene period. This primate is endemic to the island of Sardinia, and its main characteristic is its small body size. For a complete study of the Macaca majori, comparative studies are being carried out with present-day Macaca remains, aimed at extracting conclusions on this insular primate.

### Bone histology of present-day ovicaprines

12 thin sections of histological sections of long bones of present-day ovicaprines have been produced. These will be used to establish comparisons with the fossil samples.





### Bone histology of Myotragus

The study of Myotragus sections has proved that its bone tissue resembles more that of a reptile, that of certain dinosaurs or that of a primitive bird than the bone tissue of a mammal. This is inferred based on the LAGs or "lines of arrested growth", which are annual, as in the case of reptiles.

Thus the initial growth in the Myotragus was faster, but reduced from one year old onwards. From two years old onwards, the growth was similar to that of crocodiles, where the bone tissue of zones with faster development changes cyclically, followed by slower development, until it ceases (moment when a LAG, or line of arrested growth, is formed) Between the 10th and 12th LAGs, the distance between the lines of arrested growth reduces considerably. The sexual maturity stage of the Myotragus is produced after 12 years old, i.e. more than double the time in other species of continental bovids with a similar weight.

With regard to Myotragus's Base Metabolic Rate (BMR), this was extraordinarily low and fluctuated according to the season of the year. Recent studies indicate that some deer, equids and bovids of extreme climatic regions are also able to reduce the control on the endogenous thermoregulation, thus permitting the body temperature to increase (hyperthermia) or drop (hypothermia) according to the outside temperature, a circumstance that brings about very great energy-saving. The bone tissue of Myotragus suggests that this ability developed in order to adapt to the limited resources that typified the island of Majorca.

Anatomic analysis has been undertaken on 23 endocranial casts of the genera Myotragus, Cephalophus, Capra and Rupicapra::

### Database on cerebral and corporal weights

With the aim of statistically comparing the weight of the brain of infant and adult Myotragus with present-day ungulates, a database of cerebral and corporal weights was produced during 2009, along with life history parameters, age of weaning, of sexual maturation and longevity.

The preliminary results show that the ontogenetic pattern of cerebral development of Myotragus may be different to that of present-day bovids, whether wild or domesticated.

### Sample of present-day bovids

Collaborations have been established with a variety of bodies, for the purpose of obtaining bone and dental samples of present-day bovids, in order to establish comparisons. 1) with the Animal Tissue Bank of Catalonia (BTAC) of the Universitat Autònoma de Barcelona, and 2) with the Zooarchaeology Laboratory of Llleida University. The samples compared in 2009 were:

- Ammotragus lervia - cranium and femur - 5 months
- Ovis aries - cranium and femur - 5 months
- Ovis aries - skeleton - 5 months
- Capra hircus – cranium and femur - juvenile
- Capra hircus - cranium - adult
- Capra hircus - jaw - juvenile
- Ovicaprines - femur and deciduous premolar - juvenile
- Capra hircus - femur - juvenile
- Ovicaprines - skeleton - juvenile
- Ovis aries - cranium - 2 months
- Capra hircus - jaw - infantile
- Ovicaprines – metatarsus – infantilel

### Recruitment of new staff

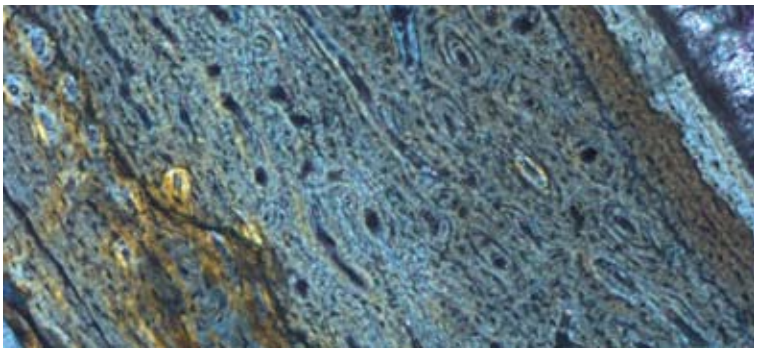
During 2009, two new researchers joined the Department of Paleobiology dos nous investigadors:

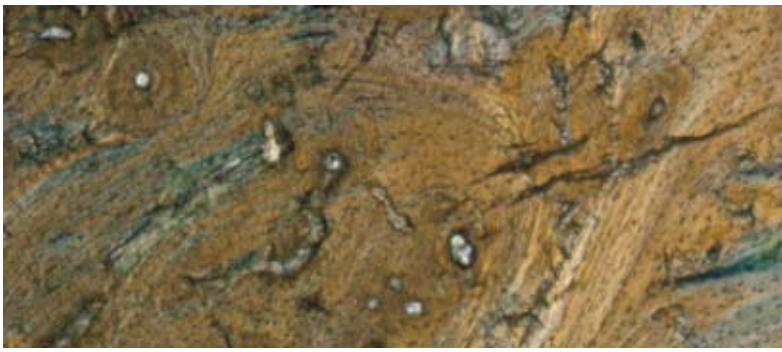
- Xavier Jordana Comin: June 2009
- Nekane Marin Moratalla: October 2009

### Publications

Articles published in journals of the Science Citation Index (SCI)
Garcia Martínez, R. & Köhler, M. (2009) Bone histology of extants glirids. Prospects for the study of fossil glirids. Journal of Vertebrate Paleontology, 29(3): 102a103a.

Köhler, M. & MoyaSolà, S. (2009) Physiological and life history strategies of a fossil large mammal in a resourcelimited environment. Proceedings of the National Academy of Sciences, 106, 48, 20354–20358.





Köhler, M. (2009) The evolution of life history traits associated to dwarfing in insular large mammals: a paleontological approach Journal of Vertebrate Paleontology: 29(3). 128a.

Books: De Esteban-Trivigno, S., Casanovas-Vilar, I., Martínez-Pérez, C., Almécija, S. & Marigó, J. (2009) I Iberian Symposium on Geometric Morphometrics. Paleontology and Evolution Special Report No. 3. ISBN: 978-84-613-3650-0..

### Posters

GarciaMartínez, R. & Köhler, M. (2009) Preliminary results on the bone histology in fossil dormice. International Symposium on Islands and Evolution, Menorca, 14 &17 September.

Jordana, X., Galtés, I., Isidro, A., Malgosa, A. & Köhler, M. (2009) Macroscopic, radiological and histological study of a tibial fracture of Myotragus balearicus. Poster, 10th National Paleontology Conference, Universidad Autónoma de Madrid..

### Research projects

During 2009, the researchers of the Department of Paleobiology participated in the following projects: Forearm pronation efficiency analysis in Hominoids, SYNTHESYS Project European Union-funded Integrated Activities grant, for acces to the Collection of the Museum National d'Histoire Naturelle, Paris, France.

Biological Anthropology Research Group (GREAB), Generalitat de Catalunya: AGAUR (2009SGR566), 45,000, 2009-2014, IP: Pilar Aluja (Universitat Autònoma de Barcelona). Multidisciplinary Approach to the Study of the Peopling of the Açores Islands (Portugal): Contributions from Skeletal and Genetic Markers, Acció Integrada Hispano-Portuguesa (E-114/08; HP2007-0047), 12.000 , 2008-2010, IP: Assumpció Malgosa (Universitat Autònoma de Barcelona) and Manuela Lima (Universidade dos Açores). Effects of Insularity, Migration and Culture on the Evolution of the Human Population of Menorca II: from the Pretalyotic to the Talyotic, Ministry of Science and Innovation (CGL2008-00800/BOS), 81,400, 2009- 2011, IP: Assumpció Malgosa (Universitat Autònoma de Barcelona).

Bioanthropological study of the Serralada Andina Merideño: Paleodontopathology, Council for Scientific, Technological and Humanistic Devlopment of the University of the Andes (CDCHT-ULA, Code: 0-054-97-09-C), 27.965 $, 2008-2010, IP: Carlos E. García Sívoli (University of the Andes).

The evolution of life-history patterns in fossil and recent insular and continental mammals: fòssils i recents: a comparative approach. Ministry of Science and Innovation (CGL2008-06204), IP: Meike Köhler (Institut Català de Paleontologia).

### Teaching and courses

Digging up silences. The Bones of the Civil War. Universitat d'Estiu de l'Autònoma, Universitat Autònoma de Barcelona, 13 - 17 July. Jordana, X.

Archaeology and anthropology field symposiums at Besora Castle. Biological Anthropology Unit, Universitat Autònoma de Barcelona. Santa Maria de Besora, 10 - 12 September. Jordana, X.

Classes taught within the subject: "Forensic anthropology" and "Human Molecular Diversity and Applications", Master's Degree in Human Biology Universitat Autònoma de Barcelona, Barcelona University. Jordana, X.

Classes taught within the module: "Vertebrate and human paleontology", Master's Degree in Paleontology, Universitat Autònoma de Barcelona, Barcelona University: courses 2008-2009 and 2009-2010. De Esteban-Trivigno, S.S.

### Conferences and Courses

Iberian Symposium on Geometric Morphometrics. July, Sabadell, Barcelona.

Introduction to Geometric morphometrics: Theoretical background and basic Analytical techniques. Juliol, Universitat Autònoma de Barcelona.

## Attendance at conferences

The evolution of life history traits associates to dwarfing in insular large mammals: a paleontological approach. Bristol, 23-26 September. Köhler, M.

The evolution of life history traits associated with insular dwarfing. International Symposium on Islands and Evolution, Menorca, 14-17 September . Köhler, M.

Preliminary results on the bone Histology in fossil dormice. International Symposium on Islands and Evolution, Menorca, 14-17 September. García-Martínez, R. and Köhler, M.

Bone Histology on extant glirids. Prospects for the study of fossil glirids. 69th Annual Meeting of the Society of Vertebrate Paleontology, Bristol, 23-26 September. García-Martínez, R. and Köhler, M.

Matrix: Techological world against the hard sediments. I Conservation Workshop, Sabadell, 20-23 April. Garcia-Alix, A., Fortuny, J., García Martínez, R. and Val, S.

Cleaning Treatments on recent small mammals bones. I Conservation Workshop, Sabadell, 20-23 April. Garcia-Alix, A., García

–Martínez, R., Sanchez-Almazán, I., Val, S. and Valls-Ramon, M. Macroscopic, radiological and histological study of a tibial fracture of Myotragus balearicus. Tenth National Paleopathology Conference, Universidad Autónoma de Madrid. Jordana, X., Galtés, I., Isidre, A., Malgosa, A. and Köhler, M.

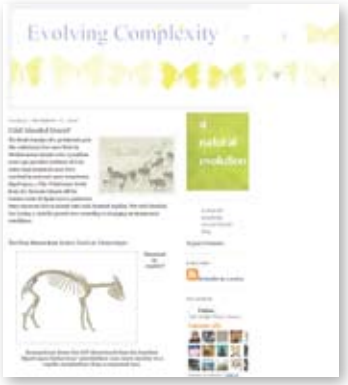
Preliminary results of the anthropological and paleopathological study of the human remains excavated at Tomb U.20 of the Necropolis of Kom al-Ahmar / Sharunas at the end of the Ancient Reign and First Intermediate Period during the 2008 campaign. Tenth National Paleopathology Conference, Universidad Autónomo de Madrid. Isidre, A., Malgosa, A., Gonzalez, E., Taule, M., Gonzálvez, L., Galtés, I. and Jordana, X.

Pathology in the burial sites at la Cova des Pas (Menorca). Tenth National Paleopathology Conference, Universidad Autónomo de Madrid. Armentano ,N., Isidre, A., Galtés, I., Jordana, X. and Malgosa, A.

The Prince of Viana. Reality or myth? Tenth Conference of the Spanish Physical Anthropology Conference, Alacalá de Henares. Simón M. González, M., Ibars,M., Galtés, I., Jordana, X. and Malgosa, A.

Bio-anthropological study of the Islamic burial sites at Tossal de les Basses (Alicante),16th Conference of the Spanish Society of Physical Anthropology, Alacalá de Henares. Laguillo, O., Núñez, A., Jordana, X., Rosser, P. and Malgosa, A.

The origin of the Pazyryks of the Altai Mountains of Mongolia, 16th Conference of the Spanish Society of Physical Anthgropology, Alacalá de Henares. González, M., Simón, M., Jordana, X., Santos, C, Aluja, M.P. and Malgosa, A.




### Participation in thesis and dissertation committees

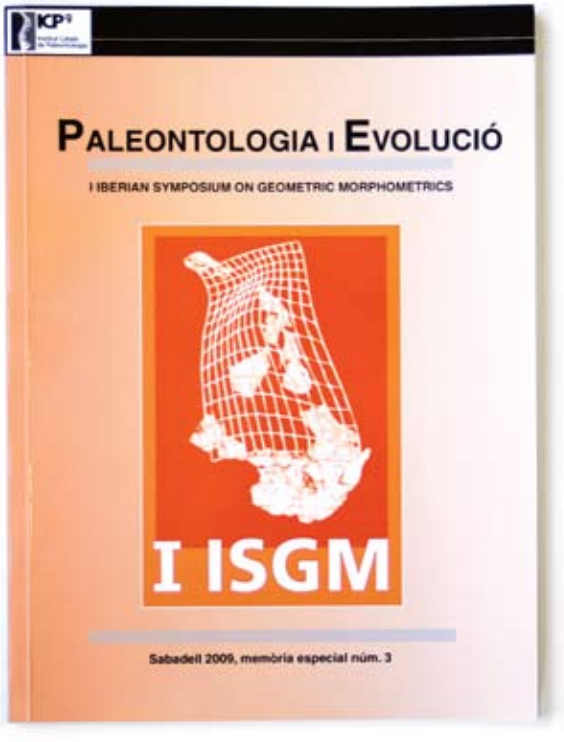
Soledad De Esteban Trivigno has acted in the capacity of Secretary of the defence committee for the research work of Sergio Almécija "Evolution of the hand in Miocene Apes: Implications for the appearance of the human hand ", Universitat Autònoma de Barcelona, 30 October.

### Other activities

Xavier Jordana has acted in the capacity of manuscript proofreader for the International Journal of Osteoarchaeology and the Spanish Society of Biological Anthropology.

Soledad De Esteban-Trivigno has been a proofreader of articles published in the Journal of Vertebrate Paleontology.

Meike Köhler has been proofreader for the journal of Vertebrate Paleontology.



# 6

## Research Virtual Paleontology Group

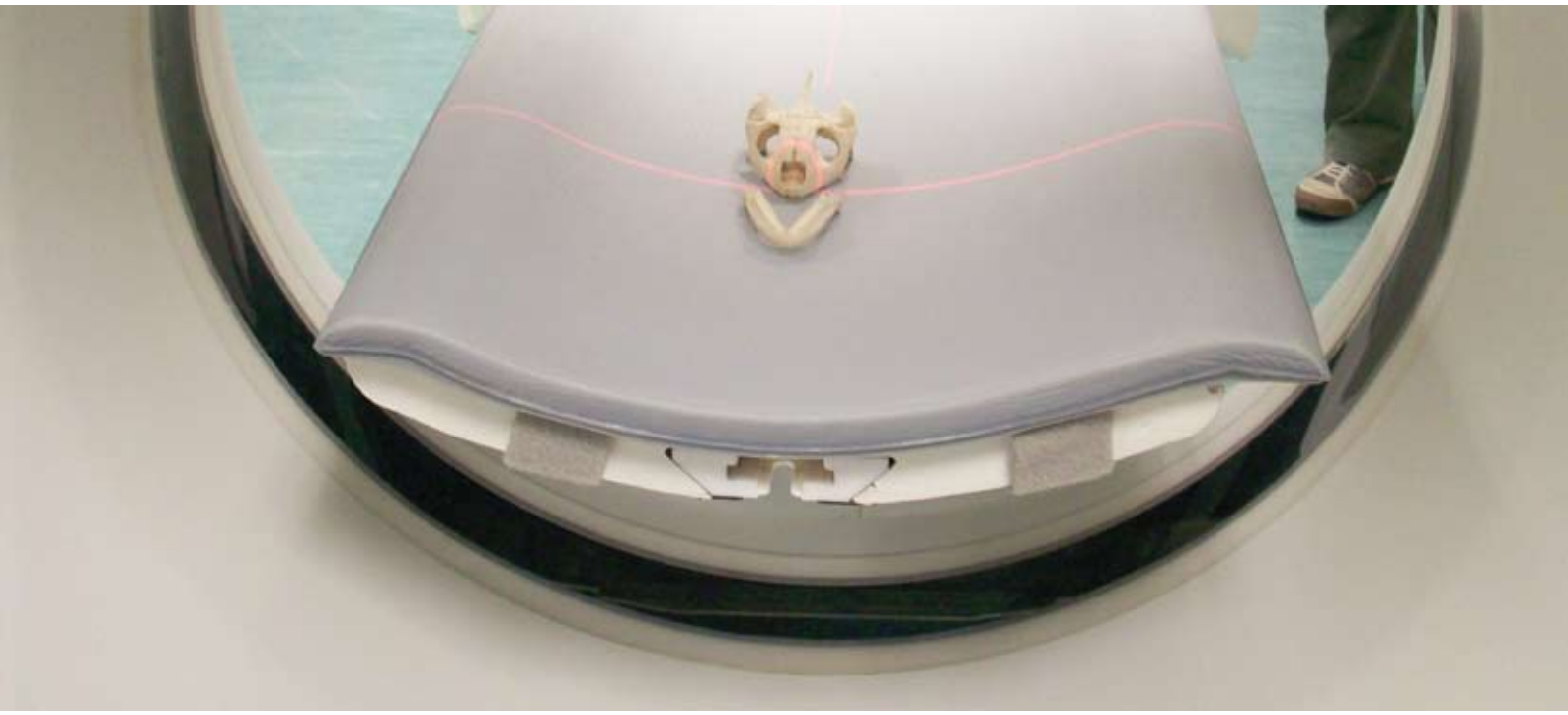
Since 2007, the ICP has had a department specialising in new technologies applied to the study of fossils: a Virual Paleontology research group. This is a transversal research group, since it works according to the specific needs of each research group in the centre. The cooperation between the various specialists and the capacity to combine digital tools and methodologies are the key to obtaining new, revealing data and hypotheses.

The fundamental task of the Virtual Paleontology Department consists of obtaining unpublished information on fossils, using a variety of techniques which adapt to the various types of material studied. The methogologies it works with are neither invasive nor destructive; thus, damage to the fossils during the study is avoided.

Examples of these technologies are Computerized Axial Tomography (CAT) or Finite Element Analysis (FEA). Broadly speaking, X-rays make it possible to observe the interior of a dinosaur egg or evaluate the thickness of enamel on a tooth without having to physically cut them. At the same time, they permit large volumes of information to be acquired, which is processed by computer software, through which tridimensional models are obtained.

At present, the Virtual Paleontology Department is maintaining collaboration agreement approved in 2007 with the Hospital Mútua de Terrassa, for digitalising fossil material by means of Computerized Axial Tomography (CAT). Many specimens have been scanned to date, among which the insular goat Myotragus balearicus, a variety of crania, jaws and phalangesof primates of the Miocene, amphibians of the Triassic or dinosaurs of the Cretaceous stand out.

So the Virtual Paleontology group is a fundamental scientific branch in the growth of ICP research , thanks to the technological tools it works with and the advantages it provides. Faster studying of fossils and a complete and detailed vision of the specimens allow high scientific quality results to be in less time.



**Brief Annual Summary**

During 2009, High Resolution Tomographies were carried out on important fossil remains of primates, such as Oreopithecus bambolii, Dryopithecus fontani, Hispanopithecus laietanus, Pierolapithecus catalaunicus or Anoiapithecus brevirostris, and work was done with the centre's other lines of research.

This work produced innovative results in fields like paleobiology of sauropod dinosaurs, paleodiet and philogenia of fossil hominids, as well as with evolutionary patterns in the endocrania of insular mammals (Myotragus balearicus).

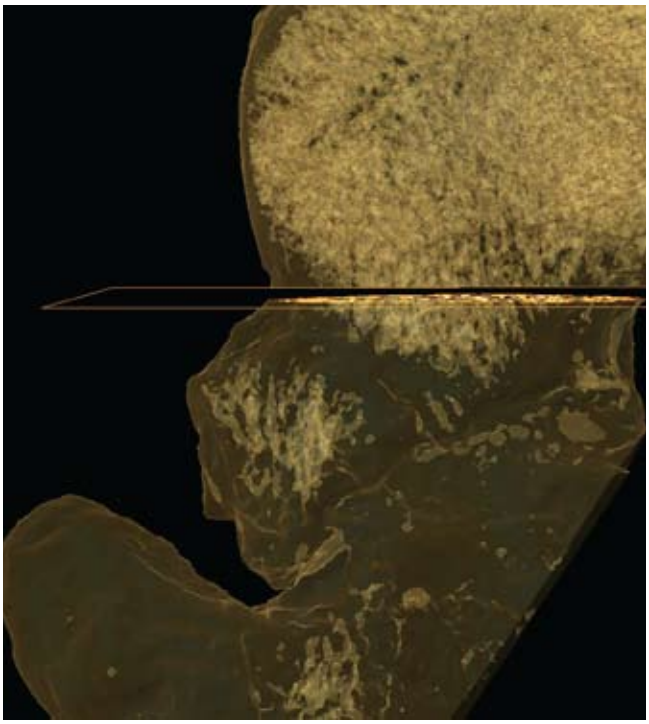
The department has begun to collaborate with the Universitat Politècnica de Catalunya (UPC), with the aim of employing methodologies traditionally used in engineering, such as Finite Element Analysis (FEA) in bi- and tridimensional models. This enables new data to be contributed on functional morphology.

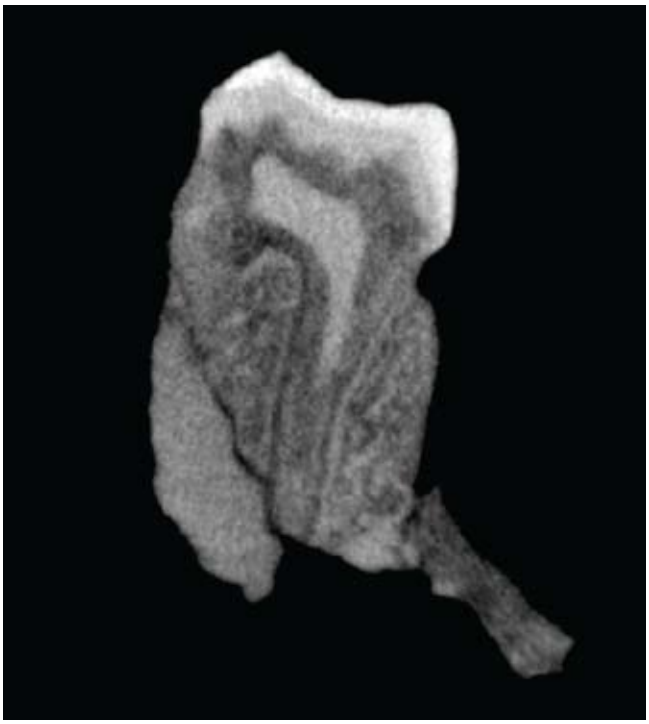
Without doubt however, the most complex and ambitious scientific installation the Virtual Paleontology Departmaent has is the Alba synchrotron. This is the largest and most important Synchrotron Light laboratory in Spain, at Cerdanyola del Vallès (Barcelona). A synchrotron is a structure in the shape of a large ring. In its interior, electrons move at a speed practically equal to that of light. This generates an extremely intense light, which is 1 billion times more powerful that X-rays.

This light permits atoms and molecules to be observed with exceptional precision. Specifically, the Alba synchrotron enables bilological structures and proteins, viruses, bacteria and fossil remains to be studied and micro design to be undertaken, amongst other things.

Finally, in 2009 the processes were initiated for obtaining new scientific equipment: a high-resolution industrial tomograph, capable of analysing specimens more than a metre long, as well as an industrial microtomography system for analysing small-sized specimens. This will permit resolutions of a micronic order of magnitude to be obtained.

*Virtual paleontology as a transversal department that combines digital tools and methodologies*





### Articles published in journals of the Science Citation Index (SCI)

Moyà-Solà, S., Alba, D.M., Almécija, S., Casanovas-Vilar, I., Köhler, M., De Esteban-Trivigno, S., Robles, J.M., Galindo, J. & Fortuny, J. (2009) A unique Middle Miocene European hominoid and the origins of the great ape and human clade. Proceedings of the National Academy of Sciences, USA. 106: 9601-9606

### Proceedings

Alba, D.M., Fortuny, J. & Moyà-Solà, S. (2009). Relative enamel thickness in Middle Miocene hominoids from Abocador de Can Mata (Vallès-Penedès Basin, Catalonia, Spain). Journal of Vertebrate Paleontology, 29 Suppl. 3: 52A-53A.

Aurell, J.M. & Fortuny, J. (2009) Computed Tomography vs. mechanical cutting: How to play Doctor House with fossil teeth. I Conservation Workshop, Sabadell.

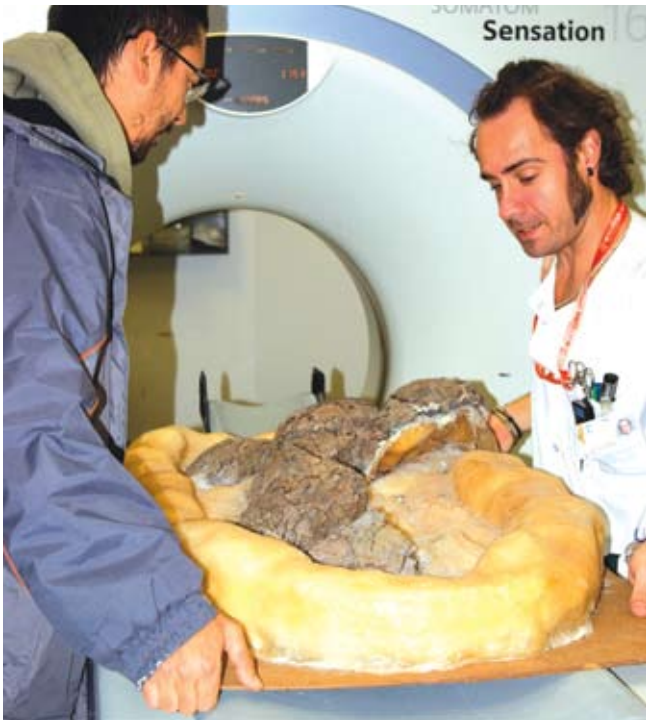
Fortuny, J., Galobart, À., de Santisteban, C. & Sellès, A.G. (2009) The vertebrate assemblage of La Mora (Middle Triassic, NE of Iberian Peninsula): Preliminary results. In: Tenth International Symposium on Mesozoic Terrestrial Ecosystems and Biota. Teruel, Spain.

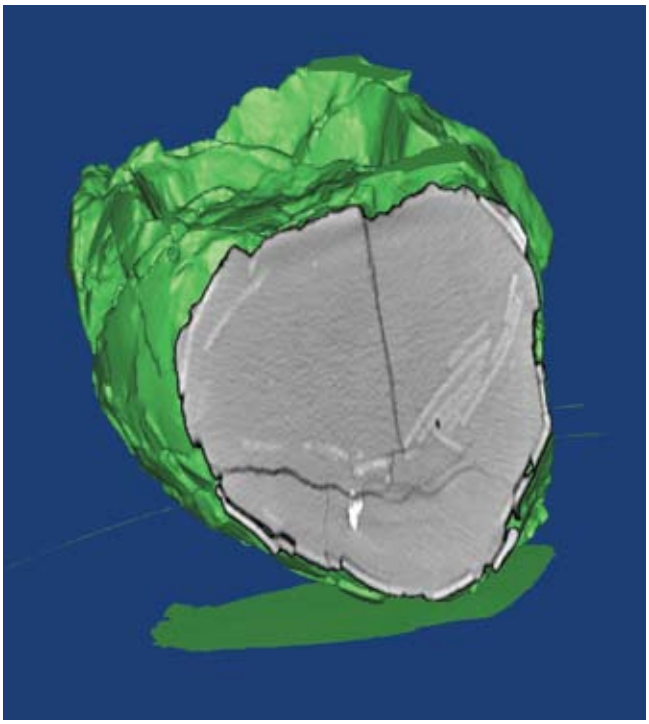
Fortuny, J., Garcia-Alix, A., Garcia-Martinez, R. & Val, S. (2009) MATRIX: Technological world against the hard sediments. I Conservation Workshop, Sabadell

Fortuny, J., Galobart, À. & de Santisteban, C. (2009) New capitosaur taxa (Amphibia: Temnospondyli) from the Middle Triassic (Early-Middle Anisian) of Iberian Peninsula. Abstracts of SVP 68th Anual Meeting. Journal of Vertebrate Paleontology, 29 Suppl. 3:97A

Valdiserri, D., Fortuny, J. & Galobart, À. (2009) New insight on old material: Triassic tetrapods footprints in Catalonia (NE Iberian Peninsula). In: Tenth International Symposium on Mesozoic Terrestrial Ecosystems and Biota. Teruel, Spain.

Vila, B., Sellés, A.G., Fortuny, J., Galobart, À. & Jackson, F. (2009) Re-Assessment of the European Megaloolithid clutch morphology. Fourth International Symposium on Dinosaur Eggs and Babies (Varricchio, Horner, Jackson and Selenitsky eds.). Museum of the Rockies Ocassional Paper, 4: 31.



## Grants and awards

Josep Fortuny obtained a mobility grant from the Synthesys programme of the European Union for a short tenure at the Museum fur Naturkunde (Mfn) in Berlin (Germany).

Josep Fortuny obtained second prize in the Joan Oró Prize for Scientific Communication with the article: "Double Triassic Challenge" awarded by the Catalan Association for Scientific Communication. 2009.

## Research projects

"Research project on the paleontological sites of the Cretaceous-Paleogene transition of the Catalan Pre-Pyrenees: systematics, paleoecology and paleobiogeographical implications 2007-2011. Chief researcher: Galobart, À.

Department of Knowledge and Research of the Directorate-General of the Ministry of Culture of the Generalitat de Catalunya

Research project on the Triassic outcrops with vertebrate fauna in Catalonia 2008-2011. Chief researchers: Galobart, À. and Fortuny, J.

Department of Knowledge and Research of the Directorate-General of the Ministry of Culture of the Generalitat de Catalunya

Evolution of the dinosaurs on the Eastern Iberian Peninsula and its surroundings during the Cretaceous. 2008-2011. Chief researcher: Galobart, À.

Ministry of Education and Science. Government of Spain Great apes (Hominoidea) of the Miocene in the Mediterranean area origin, paleobiology and evolution. 2008-2011. Chief researcher: Moyà-Solà, S.

Ministry of Education and Science. Government of Spain

Member of the Mesozoic Research Group, recognised as a "Singular Research Group"

# 7 Department of Preparation-Conservation

## Preparation-Conservatión Department

The ICP's fossil vertebrate collection is one of the most important in the world, thanks to the constant paleontological finds undertaken by the centre and the large quantity of fossil material stored.

For this purpose, the ICP has the Preparation-Conservation Department, a laboratory in constant activity, which is in charge of preparing the fossil remains using a series of varied procedures, aimed at leaving the fossil in good condition for handling without risk of damage. The aim is to preserve the specimens in the best possible way over time, once they have been incorporated into the paleontological collection.

Apart from preparing the fossils, the laboratory also produces casts, and extracts replicas from original pieces. This measure avoids endangering the genuine specimens when the pieces are studied and handled by researchers, exposed to the public or exchanged with other research centres.

The fossils that come to the preparers are basically animal or vegetable remains contained in rocks of sedimentary origin. Each requires a specific means of preparation, so that a variety of cleaning and assembly treatments are applied There are two main preparation methods: the mechanical methods, consisting mainly of removing and chipping the unnecessary rock that encloses the fossil with a hammer or chisel, and the chemical methods, based on the use of reagents that dissolve the excess rock. If the fossil is fractured, the preparers repair the piece with the collaboration of a researcher, so that it may be reconstructed the way it was originally.

Finally, the preparation laboratory performs an important dissemination task, which includes participating in conferences, carrying out practical training with restoration students, writing articles for a variety of publications and participating in symposiums open to the general public.

*The laboratory prepares the fossils to preserve them in the best possible way over time*

### Brief Annual Summary

During April 2009, the Preparation and Conservation Department produced the First Conservation Workshop in Natural Sciences, together with the Collections Management Department of the ICP. This is first the workshop in this field to be held on the Iberian Peninsula, and has generated great expectations.

With a total of 60 attendees, the speakers' and participants' assessment of this workshop was very satisfactory. Due to this success, the ICP is planning to produce a second workshop in 2011.

The Conservation-Preparation Department of the Institut Català de Paleontologia undertook the following during January and September 2009 :

### Sites prepared

An approximate total of 300 fossil remains were prepared at Peguera, Basturs Poble, Ana,Torrevilles, Coll de Nargó, Ecoparc, Hostalets de Pierola- VCE CAN VILA- CAN MATA, Hostalets de Pierola-ACM, Cal Guardiola, Els Cassots, Can Roqueta II, Incarcal.

### Conservation-restoration collection funds report

- Conservation and restoration of remains in the collections which have deteriorated during their handling.
- Conservation and restoration of fossil remains of the collections which have deteriorated due to the antiquity of the preparations.
- Restoration of copies of vertebrae of Losillaurus IPS 35371.
- Post cranial restoration of primates: IPS 46239 –IPS 46238 – IPS 46270 – IPS 46271 – IPS 46272 – IPS 46227 – IPS 7748 – IPS 46239 – IPS 46237.
- Restoration testudo graeca IPS 43810 – IPS 43809.
- Restoration shaft of elephant humerus IPS 13855.
- Restoration copy of the Swanscombe cranium IPS 36615.
- Restoration carnivore jaw IPS 16579.
- Restoration jaw of Myotragus.

### Preparation present-day skeletons

Preparation of a whole tortoise shell.

Preparation of a rabbit skeleton.

Preparation of a tissue skeleton.

Preparation of an emu egg.

Preparation of a water turtle.

Preparation of a snake skeleton.

Prpeparation of a python skeleton.

Preparation of a squirrel skeleton.

Preparation of a sparrow skeleton.

Preparations of tortoise / turtle crania for the CRARC.

Within the framework of the collaboration agreement with the Centre for Recovery of Amphibians and Reptiles in Catalonia, the following preparations have been produced: Tortuga marina, Testudo marginata,Testudo graeca ibera, Testudo hermanni, Chelydra serpentina and Agrionemys horsfieldii.

### Making casts and copies

- Copies and master copies of the crocodile footprints of Mina Squirrel - Mesozoic .
- Copy of dinosaur footprints - Mesozoic.
- Copies of Pieralopithecus hand to be sent to Japan.
- Casts and copies of Lucy.
- Copies of the whole Myotragus skeleton.
- Casts and replicas for the CRARC.
- Casts and present-day footprints - CRARC.
- Production by the Mesozoic Research Department of casts of the present-day reptile footprints in the Centre for Recovery of Amphibians and Reptiles in Catalonia.

Within the collaboration agreement with the Centre for Recovery of Amphibians and Reptiles in Catalonia, the following replicas have been produced: Cranium of Crocodylie IPS 36361, Ptychogaster EDAR – Can Llobateres IPS 764.

### Chemical cleaning trials

- Cleaning of microfauna for electronic microscopy.
- Preparation with acids of Can Mata remains.
- Cleaning trials of dinosaur shells for electronic microscopy electrònica.
- Cleaning trials for preparing the Capitosaure from Montseny.
- Cleaning trials on bivalves of the Cretaceous.

### Packaging

Technical Support to the Collections Management Department with the production of complex packages for moving large fossil remains of the Museum exhibition.

Production of new exhibition support systems for dinosaur egg clutches.

### Extraction of large clutches of dinosaur eggs

Planning and production of the system for extracting large clutches of dinosaur eggs.

Provision of new materials and systems of extraction and securing for extractions of large dimensions.

Practical training: practical training for preparers – conservers: June- July

During the summer months, Conservation and Restoration students were given the opportunity to find out and learn about the essence of paleontological conservation and preparation with practical training in our laboratory. Work was done with the following materials:

- Cal Guardiola site: Preparation of fossil remains.
- Can Roqueta II site. Preparation of postcranial remains of Proboscidi.
- Can Mata site. Preparation of Proboscidi teeth
- Maintenance of material at the permanent collection of the Museum. Cleaning and removal of old preparations.
- Production of copies of part of a Myotragus skeleton.
- Pictorial finishing of a copy of a Sauropod femur.

### Varied activities

- Budget for the Natural Science Museum of Barcelona - Zoological Museum.
  - Restoration of the skeleton of a rhea.
  - Restoration of the skeleton of an ostrich.
  - Mounting of the skeleton of an ostrich.
  - Maintenance of the MCNB permanent collection.
  - Restoration of 69 bird skeletons.
  - Restoration of the taxidermies of a Mico of the MCNB collection.
- Production of the FIRST CONSERVATION WORKSHOP in Natural Sciences, together with the Collections Management Department.
- Creation of the First Debating Forum for professional of the Natural Sciences in our Institut website.
- Production of the subject matter and content of the "Instruction course in techniques of paleontological preparation" to be carried out in the future.
- Collaboration – Training Agreement with the Higher School of Conservation and Restoration of Cultural Assets in Catalonia The joint work has been begun with training centres in Conservation – Preparation for the purpose of informing about the preparation and conservation of paleontology.
- Loan of fossil materials for preparation and loan of fossil material for producing casts and replicas.
- New laboratory projects: Project for the preparation of the new Conservation-Preparation laboratories in the new ICP building at the UAB.
- Preparation of the report on working areas for the architectural project of the Interpretation Centre planned for Els Hosatalets de Pierola.
- External projects and services: Dissemination dossier of the services to be offered by the ICP Conservation-Preparation Department.

# 8 Department of Collections Management

**The Collections Management Department of the Institut Català de Paleontologia has been commisioned to catalogue and label each and every one of the fossils, as well as to include these in the centre's database. The aim is to maintain efficient control and enable the specimens to be available to the research staff, quickly and reliably..**

The ICP's paleontological collection has over 170,000 specimens catalogued, from between 240 million years and 10,000 years ago. Thanks to the paleontological interventions the Institute carries out in every campaign, the ICP collection continues to grow every year.

Most of the fossil material comes from the group of Mediterranean basins in Catalonia and a large part of those on the Iberian Peninsula. Particularly important are the sites in the districts of the Pallars and the Berguedà (belonging to the Cretaceous period), those in the Vallès-Penedès area (Neogene period) and those at Cal Guardiola and Vallparadís, in Terrassa (Quaternary period).

Proper adminstration and documentation prolongs the life of the fossil pieces and permits their scientific and heritage importance to be disseminated. Therefore, the members of the Collections Management Department register each fossil with an attached catalogue number and include information on the site from where it originated, the age, the anatomical part and the animal to which it belongs. Finally, the location where the specimens is stored is noted.

*The ICP paleontological collection has over 170,000 vertebrate fossils catalogued*

Once a specimens has been catalogued, it is wrapped to ensure proper preventive conservation, i.e. to prevent any physical or atmospheric deterioration in the specimen. Cataloguing the specimens is fundamental so that they can be available for the scientific group studying them, as well as for the general public. Specifically, the fossil collections are subject to a multitude of entries to and exits from the centre (during teaching workshops, visits to the centre, exhibitions and consultations by researchers).

All these activities are primordial and necessary in order to tangibly transmit the the scientific value of these specimens.

### Collection

| Number of catalogued specimens 2007 | Number of catalogued specimens 2008 | Number of catalogued specimens 2009 |
|---|---|---|
| 174.000 | 184.500 | 195.051 |

### Entries of material

In 2009, Institut Català de Paleontologia had material entries on provisional deposit corresponding to the following paleontological excavations:

- Preventive paleontological excavations at the Abocador de Can Mata (Els Hostalets de Pierola, Anoia).
- Preventive paleontological excavations at Ecoparc 4 Mata (els Hostalets de Pierola, Anoia).
- Paleontological excavations at the Barcelona Orbital Motorway (4th belt) B-40, Olesa de Montserrat – Viladecavalls stretch.
- Excavations at the Ferrocarrils de la Generalitat-Vallparadís railway station (Terrassa).
- Paleontological excavations integrated with a research project at the La Cerdanya Basin (Alp, Bellver, Bolvir, Das, Fontanals, Ger, Isòvol, Lles, Meranges, Prats, Prullans, Riu and Urús).
- Paleontological excavations integrated with a research project at the Triassic outcrops in the Montseny sector (Vallès Orient tal i Osona).
- Paleontological excavations at Incarcal (Crespià, Pla de l'Estany) integrated with a research project for the paleontologica study of the Plio-Pleistocene at the Banyoles-Besalú Basin.

In each of these cases, a dossier has been created with the corresponding legal documentation (excavation permit and inventory of the materials.). The specimens have been checked in order to verify the inventories submitted and the the material reception document has been drafted.

| Excavations | Entries 2009 | Entries 2008 | Entries 2007 | Micro bags 2009 | Micro bags 2008 | Micro bags 2007 |
|---|---|---|---|---|---|---|
| Abocador de Can Mata | 6.024 | 10.147 | 4.155 | | 892 | |
| Ecoparc 4 | 3.033 | 5 | 0 | | 6 | 9 |
| B-40 (4rt Cinturó) | 1.416 | 105 | 0 | | | |
| Estació de Vallparadís (micro) | 696 | - | - | - | - | - |
| La Mora | 0 | 63 | 0 | | | |
| Peguera | 0 | 0 | 19 | | | |
| Prospeccions SOMHI | - | 0 | 168 | | | |
| Prospeccions Cerdanya | 36 | - | - | 10 | | |
| Prospeccions als Triàsics del Montseny | 12 | | | | | |
| Incarcal | 30 | | | | | |
| TOTAL | 11.247 | 10.320 | 4.344 | 10 | 898 | |

## Loan admissions

In 2009 the loan admission of the Duró-Vidal Fanmily Collection was formalised. We drafted the document for ther loan, for the inventory of loaned materials and for transport to our facilities.

| Loan admissions registered 2009 |
|---|
| 153 |

### Loans

For each loan document, the inventory of specimens was drafted (checking their state of preservation, preparing the suitable packages for transport, photographing all the specimens, both when leaving and returning to the ICP, and drafting the conditions of the loan and the insurance documents).

| Loan | Number of specimens |
|---|---|
| "The Antartctic. Polar station" exhibition. Renewal of Loan | 7 |
| Renewal of exhibition "Pau, Pierolapithecus catalaunicus. A key element in human evolution". Renewal of Loan | 51 |
| Exhibition "Sick skeletons" of the Barcelona Egyptian Museum. New loan | 1 |
| M. Freudenthal (U. de Granada), Rodentia de Can Quaranta (Campins). New loan | 7 |
| Paloma Garcia Sevilla (U. Complutense de Madrid), chiropters of Cueva Victoria. New loan | 3 |
| Jorge Morales (MNCN de Madrid), Teruelia adroveri type series. Renewal of Loan | 22 |
| Exhibition "Darwin, sa vie, son oeuvre", of the Zoology Museum of Liege University. Relica of the cranium and jaw of Hispanopithecus laietanus. | 2 |
| Renewal of the loan of material of Lynx for the extraction of DNA. Carles Lalueza | 20 |

### Register and cataloguing

During 2009, a total of 412 fossils were entered in the registry book, and were initialed, labelled, packaged and stored in the centre's collection.

| Number of registered specimens 2007 | Number of registered specimens 2008 | Number of registered specimens 2009 |
|---|---|---|
| 270 | 3.902 | 2.932 |

### Computerization

In order to obtain an easily-consulted computer database, the information in the registry books is written into Excel files. The amount of work involved in this was very great, but almost all the registry books are now computerised. During 2009, registry books 1,2,3,4,5,6,7,8 and part 12 were computerised. This means that of the 46,528 entry numbers, 46,220 are computerised.

During the final quarter of 2009, work was commenced with Museumplus in order to check the accumulation of data, to prepare the installation of Version 2.0 and to register new entries.

| Computerized specimens 2007 | Computerized specimens 2008 | Computerized specimens 2009 |
|---|---|---|
| 7.000 | 24.605 | 28.420 |

### Reports and participation in projects

- Proposal of scheduled actions for the regiter, inventory and documentation of the fossil remains at the sites ACM/C4-A1and ACM/C5-D1 (Paleontological excavations at the Abocador de Can Mata, Els Hostalets de Pierola) deposited at the Institut Català de Paleontologia.
- Assessed report on the pending paleontological works in the paleontological interventions at the Abocador de Can Mata and Ecoparc-4 (Els Hostalets de Pierola, Anoia.)
- Drafting of the Emergency Evacuation Plan for the Institut Català de Paleontologia Collection.
- Paleontological Interpretation Centre at Els Hostalets de Pierola.
- PIACAT: Comprehensive Archaeological Plan of Catalonia.

### First Conservation Workshop (together with the departments of Preparation, Projects and Communication)

Holding in Sabadell of the "First Conservation Workshop. Finding Global Solutions for Natural History Collections", on 20 and 24 April 2009. Registrations exceeded expectations, with at total of 65 participants from over 25 national and international institutions, and the presentation of 16 posters, 7 keynote sessions and 10 brief talks.

As a consequence of its success, it was decided to organise the Second Conservation Workshop for 2011 and issue a publication with the talks and posters presented. Together with the Communication Department, a virtual debating tool was created, aimed at connecting all the professionals in converstaion, restoration and management of the Natural Science collections.

# 9 Dissemination area Miquel Crusafont Museum

**The Institut Català de Paleontologia, apart from researching and conserving the paleontological heritage, has a clear desire to disseminate its knowledge to all groups of people. The aim is to generate scientific vocations in the field of paleontology and enable the public to participate in the centre's paleontological project. With this aim in mind, the Miquel Crusafont Museum regularly organises guided visits for schools and open-door symposiums, amongst other things.**

During 2009, an ambitious project was undertaken to improve and extend infrastructures, an important part of which is the renovation of the old Miquel Crusafont Paleontological Museum, located in the beautiful centre of Sabadell. Because of the renovations, this area has been closed since December 2008 and this is why visits and public exhibitions have been suspended. It is planned for the Museum to re-open its doors in October 2010.

The new museum area has been planned by an innovative company specialising in the creation of narrative experiences. The aim of the project is to transform the visit into a real learning adventure which will always remain in the visitor's memory.

The museum offers an interactive experience in which the visitor becomes the real leading player in the learning and experimenting process. Amongst other things, the exhibition will enable the public to make decisions on the excavation processes, as well as to formulate hypotheses based on the discoveries they are making. Also, the remodelling is designed to integrate all groups of people, from children and grandparents to people with sensoral or locomotive disabilities.

With this action, the ICP is consolidating its desire to share and project its scientific task to society, as well as to transmit its passion for knowledge.

## List of activities

In 2009 there were no school visits due to the refurbishments. Nevertheless, various activities with schools were still carried out.

### Acticvities with the teaching packs

During 2009, activities with teaching packs continued to function. The packs currently on loan to schools are the disnosaurs pack, that of human evolution and that of fossil diversity.

List of schools that have used the various packs

- Escola Ramar (Sabadell)
- CEIP Ribatallada (Sabadell)
- Escola Sant Jordi (Mollet)
- CEIP Joanot Alisanda (Sabadell)
- Escola Pia (Sabadell)
- CEIP Joan Maragall (Sabadell)
- Escola Scala Dei (Cerdanyola)
- Escoles Carmelites (Terrassa)
- IES Montserrat Miró (Cerdanyola)
- CEIP Roureda (Sabadell)
- CEIP Font Rossella (Sabadell)
- Escola Serra (Sabadell)
- CEIP Lloriana (St. Vicenç Torelló)
- CEIP Vall D´Aro (Castell d´Aro)
- Escola Sant Jordi (Vilanova)
- Escola Patronat Domènech (Barcelona)
- Escola 25 de setembre (Rubí)
- Ceip Font Rosella (Sabadell)
- Ceip jr Jiménez (Sabadell)
- CEIP Colònia Güell (St. Coloma de Cervelló)
- CEIP El sol i la lluna (Castellar)
- Escola La Inmaculada (Castellar)
- Escola Ca n´alzamora (Rubí)
- CEIP Gaudí (Sabadell)
- CEIP Marta Mata(Girona)
- CEIP Agnés Armengol
- CEIP Miquel Martí i Pol
- CEIP Les Parellades
- Escola Sagrada Família
- CEIP Miquel Martí i Pol
- Escola Cifuentes (Can Gambús)
- Escola Cifuentes (Can Gambús)
- Centre de Recursos del Vallès
- Universitat de Girona
- IES Jaume I (Salou)
- Escola Sagrada Familia (Granollers)
- IES Crusafont

# *The Miquel Crusafont area generates scientific vocations and provides public participation in the centre's paleontological project*

### Activities organised to celebrate Earth Year and Darwin Year

The United Nations declared 2008-2009 as International Year of Planet Earth, with the catchphrase "Earth Sciences for Society", at the initiative of the Union of International Geological Sciences and UNESCO. The aim of the declaration is to reinforce the value of the Earth Sciences in creating a balanced, sustainable future that enables our quality of life to improve, while at the same time safeguarding the planetary dynamics that make this possible.

The Institut Català de Paleontologia and the Centre for Pedagogic Resources , with the collaboration of the Geological Institute of Catalonia, have participated in these activities of this International Year of Planet Earth and Darwin Year. As a consequence, the ICP has organised the activity "Year of the Earth: Ask and we will answer you", with the participation of primary, secondary and adult schools in Sabadell. As an innovation of this year, the Institut has invited special education schools in Sabadell to participate.

To provide answers to the questions posed by the teachers and the schools, the following activities have been organised:

- A workshop with fossils, aimed at boys and girls in pre-school education and the first cycle of primary school.
- Conference for middle-cycle primary school courses on the geology of the River Ripoll and the sites found over the years. Visit to the new ICP facilities at the Universitat Autònoma de Barcelona, where students were able to witness the work done by the researchers and the application of scientific method to the research carried out. This visit is aimed at upper cycle primary schools and secondary schools.
- Power Point presentation of the various excavation techniques.
- Conference on the Theory of Evolution and Darwin Year, aimed at pre-university pupils.

All of these activities are aimed at generating awareness of the importance of geology and paleontology in the creation of a balanced, sustainable future, which will enable the planetary dynamics to be safeguarded. Because of the success achieved, this activity was re-started during November and December 2009, to coincide with the first school term.

### "Adopt a fossil" activity

The Learning and Service activity "Adopt a fossil" was designed by the ICP alongside the Learning and Service Promotion Centre, the Teaching Department of Sabadell City Council and Barcelona Regional Council.

The aim of "Adopt a fossil" is to encourage scientific vocations and promote respect for and interest in the paleontological heritage.

### Science Week activities

Science Week is an initiative aimed at bringing science closer to the public and putting it within everyone's reach. Science Week has been held annually since 1996. It is organised by the Catalan Foundation for Research and Innovation and the Ministry of Research and Innovation, Generalitat de Catalunya, together with the universities of Catalonia and other centres.

At Science Week 2009, the ICP organised a talk on paleontology, a visit to the centre's preparation workshop and a paleontological gymkhana at the UAB campus, together with the Geology Department. The exhibition demonstrated the day-to-day work of the ICP preparers, researchers and teachers.

The connection cable for these symposiums was the study of geology and biology in order to better understand the history, morphology and evolution of our planet. The diverse activities proposed enjoyed great success in terms of participation and organisation.

### Exhibitions

Scheduling of the exhibition "Pau the Pierolapithecus. A key element in Human evolution" at Els Hostalets de Pierola, from 16 July 2007 to the present.

Collaboration in the exhibition "Dinosaurs. Terribly large lizards" inaugurated at the Giner factory in Morella on 30 July.

### Collaborations

With Sabadell City Council in:

- The production of the fifth edition of the Sabadell Statistics Yearbook.
- The production of the City and School Book 2009-20010, which-brings together the entire teaching provision that the various bodies and institutions of the city offer to schools.
- Production of proposals for organising a Tourist Office and an analysis of tourism resources in Sabadell.
- International Tourism Fair.
- Council of City and School Bodies
- In the organisation and coordination of the course "Darwin Year" : Paleontology and Evolution" with Sabadell Universities. The Sabadell University Association is an association made up of Sabadell City Council and the universities UAB, UOC, Fundació UPC, ESDI, la Fundació Parc Taulí - Institut Universitari and the Institut Català de Paleontologia
- In the the monitoring of pre-university research work in various secondary schools.
- In the preparation of research work proposals and diverse activities with the Vallès Occidental Centre for Pedagogical Resources. Occidental.
- With the Mare de Déu de Montserrat special education school, a school for students with special educational needs. The ICP has a student from this centre doing practical training.
- In advising and loaning material to Girona University for preparing workshops on paleontology and evolution during Science Week.

### Others

Presentation of the book "It smells of dinosaurs" at the Vapor Badia library, commissioned by the authors of the work. A copy of this book was later issued to the primary schools of Sabadell and the libraries of Barcelona Regional Council and the Generalitat de Catalunya.

Confirmen el descobriment d'un nou simi fòssil a l'Anoia

Els experts de l'Institut Català de Paleontologia bategen l'individu de la nova espècie com a Lluc Les restes trobades el 2004 ajuden a entendre l'evolució dels humans

La xifra

11,9

# 10

# Department of Communication and Scientific Dissemination

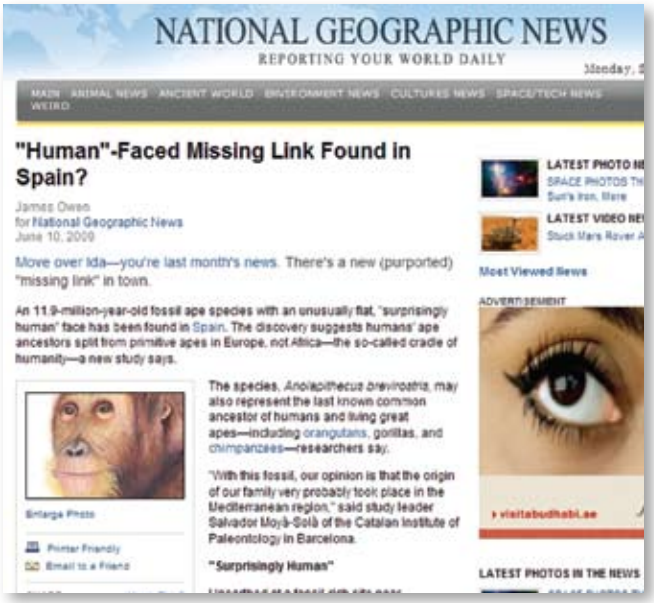
**Most scientific institutions currently have a communication team in charge of communicating and disseminating the research work carried out by the scientific staff working there.**

**The Department of Communication and Scientific Dissemination is charged with acting as a bridge or translating between the various research members of the ICP and society as a whole. Thus, The Communication Department's main aim is to achieve efficient transfer of the knowledge obtained and worked on in the ICP to the public.**

The Communication Department is proposing a new communication strategy in which the key factors consist of getting closer to the public, linking communities and creating content. For these purposes, the Communication team works with the existing variety of communication channels and platforms, and uses the various communication strategies each one of these options provides.

The aims of the IPC Communication Department are:

- Bring closer and communicate vertebrate and human paleontology, paleontological restoration and the conservation and management of paleontological collections in society.
- Create high-content, modern channels of communication and dissemination, which reach people.
- Get to know IPC's current audience and try to increase it in diversity and number.
- Create an IPC social network environment and create loyalty among the people who make it up.
- Be generators of content in the paleological field adapted to all audiences or aimed at a wide range of people.






## Option 2.0

More and more research centres are choosing Option 2.0 to get closer to the public. The term 2.0 refers to a second generation in the history of the web, based communities of users and a special range of services, such as the social networks, blogs, wikis and tags, which encourage cooperation and fast exchange of information among the diverse users, thus creating a collective intelligence aimed at building knowledge.

We can find examples of these strategies in international and international institutions such as: Facebook, Twitter, Youtube and Flickr at the Connecticut Science Museum.

In recent years, the ICP has had a reactive communication department, in other words, one which reacts to the requests from the Press and teaching or institutional centres. Therefore, most of its tasks are based on satisfying the needs of other communictors or scientific disseminators.

## Summary of the Department of Communication and Scientific Dissemination 2009

During 2009, the Department of Communication and Scientific Dissemination initiated a proactive attitude that was not only reactive, i.e. an attitude of creation of content, search for concerns and organisation of physical and virtual meeting points. At the same time, paleontoloy has been brought closer to the online media, wiht the aim of reaching a diverse and numerous audience, paying special attention to the general public, enthusiasts, families and the specialist audience.

This new communication strategy has been based on the creation and mangement of the IPC blog (http://www.icp.cat/blog/) with different categories for people with different concerns; the creation of the Youtube channel (http://www.youtube.com/icpcomunicacio) and the creation of a web platform of confrerences, workshops and other specialised activities (http://www.icp.cat/congressos/). Social platforms have also been created, such as the Forum for Preparation, Conservation and Management of Collections (http://www.icp.cat/blog/?page_id=103).

All these platforms are united under a single website that is more modern, visual and navigable: http://www.icp.cat/.

The Communication Department has activated a Flickr account (which has photographs of the ICP) and various social networks, both general and specialised. We are one more member of Facebook and characters such as "Anoiapithecus brevirostris" enjoy great popularity.

Furthermore, during 2009 the ICP participated with many groups carrying out educational and dissemination projects. Specifically, the requests from the Teide group have been granted, aimed at improving the updating and quality of secondary school books; several collaborations have begun with a variety of initiatives of the Ministry of Research of the Generalitat de Catalunya, such as "Live Research" or "Direct Research"; constant, direct contact has been maintained with the general and specialised communications media; such as La Vanguardia, El Periódico, El Punt, El Temps, Com Ràdio, Catalunya Ràdio, Cadena Ser Barcelona, Ràdio 4, TV3, Barcelona TV, TV Balear (IB3), Diari de Sabadell, Avui Sabadell, Ràdio Sabadell, Ràdio Berga, Diario de Teruel, Heraldo de Aragón, Heraldo de Soria, Regió 7, Sapiens, Omnis Cellula or National Geographic, for example.

## Newspapers and Magazines


Els paleontòlegs veuen l'obra del metro com un gran jaciment de fòssils


La morfometria geomètrica reuneix a Sabadell cent científics de mig món


Science


regió7.cat

Trobat un fòssil de tortuga del cretaci a Fumanya


Regió7

El jaciment de Fumanya s'enriqueix amb nous rastres de dinousaures


Un estudi descobreix rastres inèdits de titanosaures a les parets de Fumanya


Europa

Un experiment d'estudiants de la UPC surt a l'espai


El Mercat de Sant Joan prepara noves activitats

NOU

gaudeix

## Radio collaborations

The ICP has been in the news and has given numerous interviews on Catalunya Ràdio, COM Ràdio, Ràdio Sabadell, Cadena Ser, Ràdio Esparraguera, Ràdio Berga, Ràdio Igualada, among others.

## Results

During the first quarter of 2009, the participation and loyalty of our audience, both existing and new, have increased through the 2.0 platforms. In under 4 months, the number of the ICP's Facebook friends climbed to over 190, and Anoiapithecus brevirostris, a new genus of hominid, had more than one hundred fans.

In addition, external communication with the general media has increased. Specifically, a Press conference was held at the Auditorium of the Faculty of Sciences of the Universitat Autònoma de Barcelona (UAB) and there were various informative campaigns related to articles published in the well-known science magazin Proceedings of the National Academy of Science, USA (PNAS), as well as events in diverse fields held by the centre: the First Conservation Workshop, and the First Iberian Symposium on Geometric Morphometrics, the closing ceremony of the old Institut or the signing of a variety of agreements.

Finally, we must not forget that the ICP is still a benchmark centre in vertebrate and human paleontology. This is borne out in the pedagogic and dissemination sphere due to the large quantity of collaborations the centre has undertaken. Good examples of these collaborations are to be found in:

- Pre-university biology textbook published by Teide.
- Scientific dissemination book "Laura and Joan follow the trail of the dinosaurs".
- Collection of children's books "Laura and Joan".
- Exhibition: "Dinosaurs. Terribly large reptiles".

Finally, the Department of Communication Scientific Disseminaton has prepared a strategy aimed at involving the entire ICP team in the communication programme, meaning that each member of the centre can publish his or her own personal page on the centre's website, for the purpose of working on the centre's image in a single, common stylistic and corporate ambit.

During 2009, there was strong commitment to achieving proactive, interactive and modern management. The exploration of new possible formats of participation and the generation of small community-creating events are the basis of this strategy. Thus, working on all the open platforms of the website has become a stimulus for the day-to-day work of the Communication Department.

Finally, for this year of 2010, it is planned to open the new ICP Museum. A Science Museum is a magnificent tool for disseminating and informing about science, and in our particular case about paleontology. This is why the Communication Department also aspires to be able to use and work together with the Dissemination Area – Museu Miquel Crusafont of the ICP.

## *The ICP in Pre-university textbooks*

# 11 Department of Management

**The Institut Català de Paloentologia (ICP) Management Department is responsible for planning and coordinating political and financial proposals, both internally (staff) and externally (public bodies and institutions). The purpose of this department is to programme the centre's financial needs in advance and find the most suitable way of funding each specific project.**

To this end, the Management Department works with the indispensable tools for controlling and rationally investing the resources. In this way, the ICP's objectives are met efficiently and effectively, in strict compliance with the regulations and laws applicable while decisions are being made.

For this reason, the Management Department ias an essential component in the ICP chain of command, both in the way it plans the centre's ideal desirable development, and the best strategies to achieve this.

# *The Management Department controls and rationally invests the centre's resources*

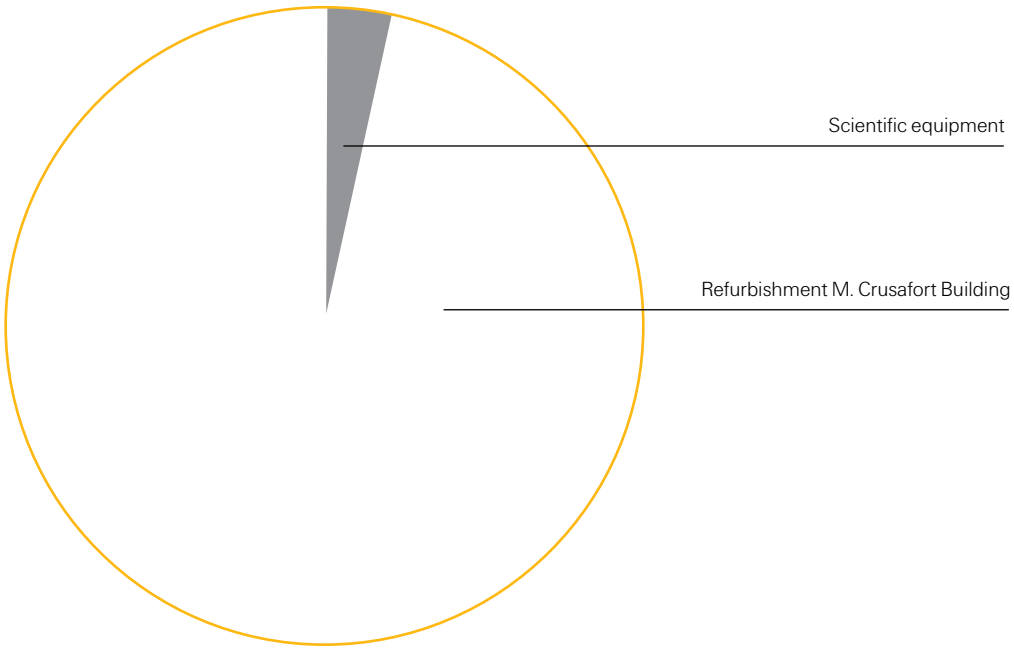
**Investment 2009**

- FEDER funds for the refurbishment and remodelling of the Miquel Crusafont Building in Sabadell: 563,486.24
- FEDER funds for scientific equipment: 19,915.52
- Investments charged to own funds: 56,716.31

Total: 640.118,07

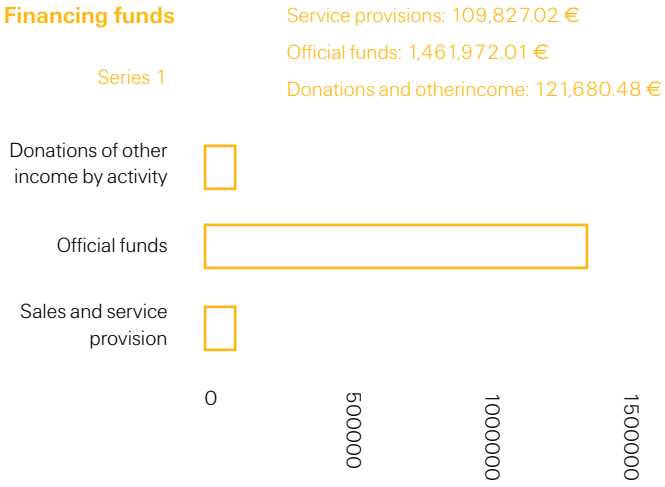
- Application during 2009 of FEDER funds 2007-2013

Scientific equipment: 19.915,52
Refurbishment of the Miquel Crusafont Museum area: 63.486,24

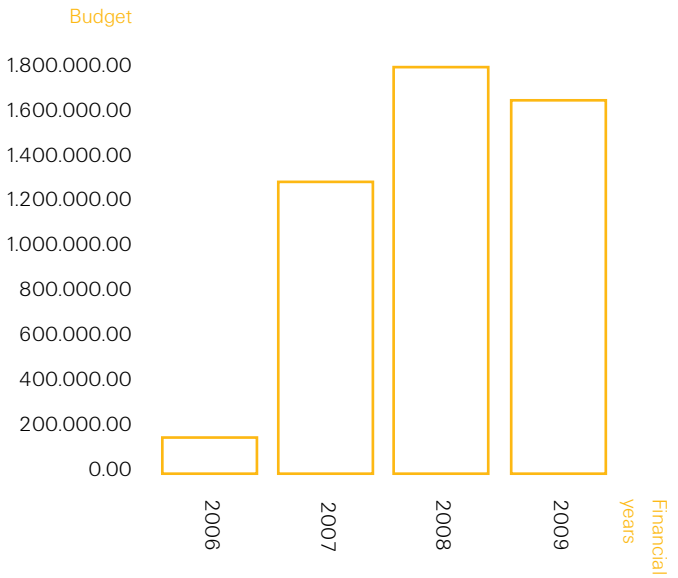


- The deadline given for carrying out the refurbishment project is September 2013.
- In total, the resources obtained for carrying out the FEDER project come to 3,260,000 euros, of which 1,200,000 euros are dedicated to refurbishing the Miquel Crusafont Building in Sabadell, 500,000 euros to acquiring scientific material and 1,560,000 euros to the construction of a new building within the bounds of the UAB campus at Bellaterra (Barcelona).
- This last project, with a total cost of 3,300,000 euros, has been funded through an extarordinary contribution by the Generalitat de Catalunya to the amount of 1,630,000 euros; the remaining amount coming from the ICP's own resources.
- With the creation of the new facilities, the ICP will have two centres dedicated to covering the needs of the following areas: laboratory, research, collections, exhibitions and storage.

**Funding of activities undertaken by the Institut Català de Paleontologia during 2009**



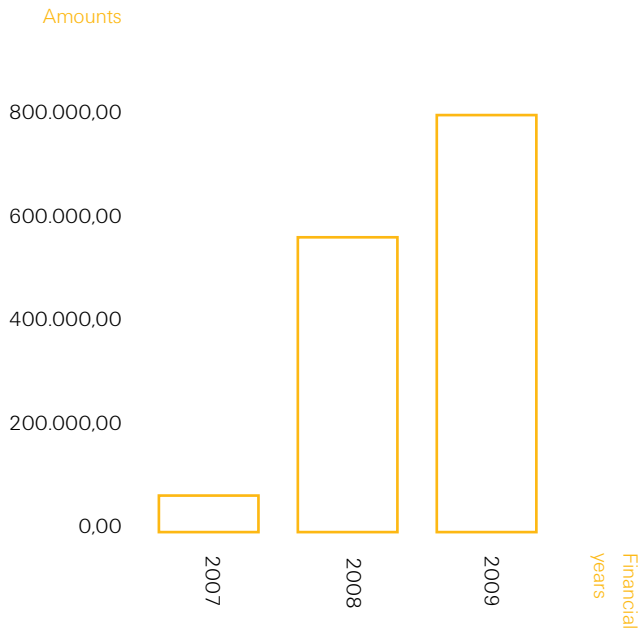

**Progress of the ICP funding budget**



## Research projects with funding by public Bodies

- Urgent excavations at the Vallparadís site; GISA; 494,856.41 euros (2007)
- Prospections and excavationss in the Pre-Pyrenees; Ministry of Culture; 9,100 euros (2007)
- Prospections and excavationss in the Pre-Pyrenees; Ministry of Education; 11,328.80 euros (2007)
- Publishing of informative research report on the Mesozoic; FECyT; 15,000 euros (2007)
- Origins of the Hominoides Project; University of Berkeley; 10,065.46 euros (2007)
- Management of Miquel Crusafont Museum; 84,000 euros (2007)
- Pre-doctorate contracts fund; AGAUR; 15,304.80 euros (2007)
- Urgent excavations at the Vallparadís site; GISA; 6,817.04 euros (2008)
- Prospections and excavationss in the Pre-Pyrenees; Ministry of Culture; 16,650 euros (2008)
- Prospections and excavationss in the Pre-Pyrenees; Ministry of Education; 11,328.80 euros (2008)
- Informative research activities on the Mesozoic; FECyT; 8,406.73 euros (2008)
- Origins of the Hominoides Project; University of Berkeley; 13,491.53 euros (2008)
- Management of Miquel Crusafont Museum; 607,652.92 euros (2008)
- Pre-doctorate contracts fund; AGAUR; 18,770.35 euros (2008)
- Post-doctorate contracts fund; Juan de la Cierva MCIN; 33,000 euros (2008)
- Post-doctorate contracts fund; I3 MCIN programme; 43,333.33 euros (2008)
- Service provisions; Barcelona City Council MCNCB; 88,381.51 euros (2009)
- Prospections and excavationss in the Pre-Pyrenees; Ministry of Culture; 31,410 euros (2009)
- Research projects; ENCyT; 85,254.61 euros (2009)
- Management of Miquel Crusafont Museum; 370,501.95 euros (2009)
- Pre-doctorate contracts fund; AGAUR; 39,952.15 euros (2009)
- Post-doctorate contracts fund; Juan de la Cierva MCIN; 33,000 euros (2009)
- Post-doctorate contracts fund; I3 MCIN programme; 43,333.33 euros (2009)
- Post-doctorate contracts fund; Ramon y Cajal MCIN; 12,362.05 euros (2009)

## Progress of the ICP funding budget



# 12 Funding and Projects

**The Funding and Projects Department of the Institut Català de Paleontologia, created in September 2006, concentrates on attracting financial resources and selecting the most suitable financing funds for each ICP research project, both nationally and internationally.**

With regard to grants, the Funding and Projects Department is in charge of finding national and international financial assistance so that the researchers can opt for the various awards offered by public and private bodies around the world. The Department revises the entirety of requirements established in the various funding announcements and communicates these to the researchers. Thus total compliance with the stipulated mode and deadline is guaranteed.

The Projects Department basically manages the following award types: Grants for carrying out doctorate or pre-doctorate studies, which include the annual funding announcements of the Ministry of Education (University Professorship Training and Research Staff Training). The object of these is to fund the conducive stages in order to prepare the doctoral thesis.

Grants and post-doctorate research contracts, aimed at perfecting doctors, both in Spanish and foreign research centres Among others, there stand out the allocation of the Ramón y Cajal Programme (for doctors who have completed their external tenure) and that of the Juan de Cierva Programme (aimed at new doctors, dependent on the Ministry of Education and Science, for undertaking research projects by means of a contract).

They include accommodation, maintenance, transport, etc. Consequently, the ICP Projects Department is confirmed as a service dedicated to the researchers of the centre, making it possible for them to make the best use of the time dedicated to research, without having to spend time on formalising and fulfilling bureaucratic procedures.

*The Department selects the most suitable financing funds based on each research project*

**A. Grants, projects and contracts awarded in 2009**

**Grants**

Ramón y Cajal Programme. Dr. David M. Alba was awarded a Ramón y Cajal contract in the ICP Department of Primatology and Human Paleontology, funded by the Ministry of Science and Education.

"Synthesys" Programme of the European Union. J. Madurell Malapeira has obtained a mobility grant for a short research tenure at the Museum for Central Africa at Tervueren (Belgium). Period of tenure: May 2009.

Award of an FPI grant from the Sub-directorate of Training and Mobility of Researchers of the Ministry of Science and Innovation for the research project "Evolution of the Dinosaurs in the Eastern Iberian Peninsula during the Cretaceous: Paleobiological and Paleoecological Systematics and Inferences". (Recruitment of the FPI grant-holder Arnau Bolet Mercadal, 1 October 2009).

Synthesys grant: Awarded to Josep Fortuny. 2009. Destination: Museum fur Naturkunde (Berlin, Germany). Project title: "Functional morphology of capitosauroids (Amphibia, Temnospondyli): implications for locomotion and feeding".

Award of an FPI grant from the Sub-directorate of Training and Mobility of Researchers of the Ministry of Science and Innovation for the research project "Great apes (Hominoidea) of the Miocene in the Meditattanean area: origin, evolution and paleobiology". (CGL2008-00325/BTE), and funded by the Ministry of Science and Education. 2009-2011. (Recruitment of FPI grant-holder Miriam Pérez de los Ríos, 1 October 2009).

Award of an FPI grant from the Sub-directorate of Training and Mobility of Researchers of the Ministry of Science and Innovation for the research project "The evolution of life history patterns in fossil and recent insular and continental mammals: a comparative approach. Ministry of Education and Science, CGL2006-04548/BTE. 2008-2011. (Recruitment of the FPI grant-holder Nekane Marín, 1 October 2009).

AGAUR - Grant for funding actions in the sphere of scientific dissemination to the project "ANA", an interactive dinosaur site" by the Universities and Research Grants Agency i de Recerca. Santos-Cubedo, A.

AGAUR- Grant for the training of staff in research centres awarded to Laila Pilgren for a tenure at the National History Museum of New York.

AGAUR – FI pre-doctorate grant, Generalitat de Catalunya (reference 2010FIB176), awarded to Judit Marigó.

Grant from the SYNTHESYS Project , financed by European Community Research Infrastructure Action under the FP6 ''Structuring the European Research Area'' Programme.

# *The department is confirmed as a service dedicated to the researchers of the centre*

### Projects awarded in 2009

"Great apes (Hominoidea) of the Miocene in the Mediterranean area: origin, evolution and paleobiology" (CGL2008- by Salvador Moyà-Solà, funded by the Ministry of Science and Education. 2009-2011. 121,000.

Evolution of the dinosaurs on the Eastern Iberian Peninsula and its surroundings during the Cretaceous: paleobilogical and paleontological systematics and inferences". Ministry of Education and Science, CGL2006- 04548/BTE. 2008-2011. 78,000 euros.

"The evolution of life history patterns in fossil and recent insular and continental mammals: a comparative approach". Ministry of Education and Science, CGL2006-04548/BTE. 2008-2011. 96,800 .

Consolidated Research Group (CRG) Paleoprimatology and Human Paleontology PIPH, funded by the AGAUR of the Ministry of Innovation, Universities and Enterprise of the Generalitat de Catalunya. 2009-2013. 50,000.

Biological Anthropology Research Group (GREAB), Generalitat Generalitat de Catalunya: AGAUR. IP: Pilar Aluja (Universitat Autònoma de Barcelona) (2009SGR566), 2009-2014. Participating ICP researcher Dr. X. Jordana.

Recognition of the "Mesozoic Research Group" as a Singular Research Group by the Universities and Research Grants Agency for the period 2009-2013.

2009-2010. Inforegió Project (2009 REGIÓ 00011), "Virtual Paleontology: digitialisation and interaction with fossils". Collaboration with the group 'Modeling, Visualization, Interaction and Virtual Reality Research Group' (MOVING) of the Universitat Politècnica de Catalunya (UPC) and with the company 'Tangent'.

### Contracts

Gisa. Restoration of paleontological materials of the West Ring Road, Sabadell site. 70,238

Geoterna, SL: Preparation-restoration of the fossil remains extracted by the company GEOTERNA, SL at the prolongation of the FGC railway at Terrassa (Dossier 437 K121 N810).

Zoological Museum, Barcelona (Barcelona Institute of Culture): preparation and restoration of osteological material of the Zoology Museum.

Geoterna, SL. : Budget for the preparation-restoration of the fossil remains extracted by the company GEOTERNA, SL at the B-40, Tram Abrera-Olesa de Montserrat (Baix Llobregat).

Archaeology and Paleontology Service, Directorate-General of the Cultural Heritage, Ministry of Culture. Restoration of fossils – Can Filuà (Santa Perpetua).

UTE-ecoparcSL. Restoration prpeferential fossil remains Can Mata-Ecoparc-4 -Hostalets de Pierola. 175,000.

Geoterna, SL: Restoration fossil remains at the Can Filuà site (Santa Perpetua). 26,100.

Barcelona Museum of Natural Sciences (Barcelona Institute of Culture: Budget for restoration of whale.

### B. Active research projects

Consolidated Research Group (CRG) Paleoprimatology and Human Paleontology Group PIPH, directed by Prof. Salvador Moyà-Solà of the Institut Català de Paleontologia, and financed by AGAUR of the Ministry of Innovation, Universities and Enterprise of the Generalitat de Catalunya. 2009-2013.

Recognition of the "Mesozoic Research Group" as a Singular Research Group by the Universities and Research Grants Agency for the period 2009-2013.

"Inforegió Project (2009 REGIÓ 00011), Virtual Paleontology: digitialisation and interaction with fossils". Collaboration with the group 'Modeling, Visualization, Interaction and Virtual Reality Rearch Research Group' (MOVING) of the Universitat Politècnica de Catalunya (UPC) and with the company 'Tangent'.

"Paleontology of Vertebrates of the La Cerdanya Basin" project, directed by Joan Madurell, approved by the Arcaeology and Paleontology Service of the Generalitat de Catalunya, and financed by the Institut Català de Paleontologia. 2009.

"Paleontology of Vertebrates of the Banyoles-Besalú Basin" project 2009-2013, directed by Joan Madurell, approved by the Archeology and Paleontology Service of the Generalitat de Catalunya, and financed by the Institut Català de Paleontologia in 2009

"Research project on the paleontological sites of the Cretaceous-Paleogene transition of the Catalan Pre-Pyrenees: Systematics, paleoecology and paliobiogeographical implications". 2007-2011. Presented at The Research and Knowledge Department of the Directorate-General of Hertiage, of the Ministry of Culture of the Generalitat de Catalunya.

SOMHI research project (Searching for the Modern Hominoid Initiative). Middle and Upper Miocene paleontological sites of the basins of Catalonia, with the aim of studying the origin and evolution of the living hominoides. 2007-2011. Presented to the Department of Knowledge and Research of the Directorate-General of Heritage, Ministry Ministry of Culture and the Media.

"Research project on the Triassic outcrops with vertebrate fauna of Catalonia". 2008-2011. Presented to the Research and Knowledge Department of the Directorate-General of Heritage, Ministry of Culture of the Generalitat de Catalunya. Directors: Àngel Galobart and Josep Fortuny.

"Paleontology of Vertebrates of the Banyoles-Besalú Basin" project 2009-2013, directed by Joan Madurell, approved by the Archeology and Paleontology Service of the Generalitat de Catalunya, and financed by the Institut Català de Paleontologia in 2009. Participating members of the of the group: I. Casanovas-Vilar, J. Robles, C. Rotgers.

"Great apes (Hominoidea) of the Miocene in the Mediterranean area: origin, evolution and paleobiology" project (CGL2008-00325/BTE), directed by Salvador Moyà-Solà, and financed by the Ministry of Science and Education. 2009-2011. 121,000.

Project "Sedimentology and sequential stratigraphy of the Jurassic and Cretaceous materials of the continental units of the South-Western Iberian Basin and of the Morella Formation (Maestrazgo Basin)". Funding body: MEC. Participating bodies: Valencia University. 2008-2011.

"The evolution of life history patterns in fossil insular and continental mammals: a comparative approach". Ministry of Education and Science, CGL2006-04548/BTE. 2008-2011. 96.800.

"Evolution of the dinosaurs on the Eastern Iberian Peninsula and its surroundings during the Cretaceous: paleobilogical and paleontological systematics and inferences". Ministry of Education and Science, CGL2006- 04548/BTE. 2008-2011. 78,000 euros.

Project "Dynamics of Terrestrial Ecosystems in the Plio-Pleistocenein the basins of Spanish Levante" (CGL)", directed by Jordi Agustí (IPHES, Universitat Rovira i Virgili), and financed by the Ministry Ministry of Science and Education. 2006-2009.

"Effects of insularity, migration and culture on the evolution of the human population of Minorca II: of the Pre-Talaiotic and Talaiotic". Ministry of Science and Innovation (CGL2008-00800/BOS). IP:

Dr. Assumpció Malgosa (Universitat Autònoma de Barcelona) Participating researcher Dr. X. Jordana.

Project "Vallès-Penedès contextual project", in the context of the RHOI (Revealing Hominid Origins Initiative), directed by Prof. T. White and financed by the National Science Foundation (NSF) (RHOIHominid- NSF-BCS-0321893). 2005-2009.

"Iberian Dinosaur Track Project" with the collaboration of Manchester University (United Kingdom). Laser scans at the 11 sites with dinosaur ichnites on the Iberian Peninsua included in the UNESCO canidature for World Heritage Site UNESCO. Researchers: Àngel Galobart, Bernat Vila, Albert Garcia Sellés, Arnau Bolet.

"X-ray-diffraction project". ICP- Biological Anthropology Unit UAB - University of Sardinia (Italy). Research project to endeavour to assess the possibilities of developing a new method of absolute dating, based on the difraction of X-rays. This project, essentially funded by Sassari University, is founded on the paleontological samples stored by the ICP. Andrés Santos, Àngel Galobart participate on behalf of the ICP, on behalf of Italy, Giampaolo Piga (Tyrosine student at the UAB), Stefano Enzo (Professor of the Chemistry Dept. Unversity of Sardinia) and Assumpció Malgosa (Professor BABVE Dept., UAB).

Bioanthropological study of the Merideña Andean mountain range: paleodontopathology". Council for Scientific, Technological and Humanistic Development of the University of the Andes (CDCHT-ULA, Code 0-054-97-09-C). IP: Carlos E. García Sívoli (University of the Andes). Participating researcher Dr. X. Jordana.

"Multidisciplinary approach to the study of the peopling of the Azores Islands (Portugal): contributions from skeletal and geneticmarkers". Hispanic-Portuguese integrated action (E-114/08; HP2007-0047). IP: Dr. Assumpció Malgosa (Universitat Autònoma de Barcelona). Participating researcher Dr. X. Jordana.

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