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# CRUZIANA

GEOPARK NATURTEJO DA MESETA MERIDIONAL - UNESCO GLOBAL GEOPARK - E-MAGAZINE



## Geo Stories of our places and people: Penha Garcia

Penha Garcia is an amazing land: white and sunny, lies on Serra do Ramilo, the last Templar Knights Castle in the border, and spreads on a cork oak forest's flatness. We may find Penha Garcia coming from West following the impressive relief of perfectly aligned sharp edges; from the border the perspective is of a huge wall, Serra Gorda limiting the tiny road that climbs Termas de Monfortinho, meandering by the Ponsul fault scarp on the South corridor bounded by the conical mount of Pedras Ninhas and, behind this, Murrachinha. We arrived and are unconsciously compelled to climb in the direction of something inexplicable, but it's there and we feel it.

From Largo Chão da Igreja we see the first red houses with traditional architecture in local stone, the quartzite, which can be aged 70 or 700 years old, pass by the pillory and the church, existing elements in all our villages where once had administrative autonomy. Be surprised by the lanes and the cannons which are disposed to kill the tiredness of the traveler. Yearning to reach the highest point of the Castle, at the height of the Penha, not because it's a work of remarkable military architecture, but because it is one of the most extraordinary viewpoints, with views that reach the plans of the plateau "Extremeño" beyond South of S. Mamede, the cliffs of Talhadas and Muradal, the soft granitic from Gardunha, with his back to the larger twin Estrela. Closer, the always impressive Monsanto rough raised of a sea of green and grass, with other unique neighbors, as volcanic cones on a hotspot, remnants of the geological history of a Plateau in formation. The presence of the Ponsul fault scarp that bisects the landscape in two, creating two dimensions of green, or green and yellow in summer, losing sight to the South. But what do we have in the other band? A wonderful Valley made of rocks, great rocks made of successive layers facing the abyss, as archived books in boxes in a used book store. Must dive in this Ordovician sea, dating from an astounding 480,000,000 years. Almost each and every one of these layers is holder of the sedimentary record of this ocean transformed into Variscan Mountain, which was folded and then eroded to create a U-shaped mountain, with two quartzitic bristly sides and a shale core depressed by fitting the Ponsul River, which here has its headwaters. In the flat bedding planes of quartzite we will find, like symbolic art of our ancestors or expressive abstractionism of Kandinsky, life signs contained in the rock. Intricate pathways, materialized by the contemporary filling of excavations produced by trilobites, arthropods group exclusively marine that dominated the oceans for many million years. Here we find thousands of these forms, the Cruziana, with multiple patterns representing so many other solutions to the mode of feeding of these animals.

Millimeter or oversized, Cruziana of Penha Garcia report us the food life cycle of these long extinct animals. That is not all, though. There are more than 30 different behavioral approaches developed by benthic communities who lived here for nearly 10 million years, in a landscape made of sea, anytime when the view would not be reduced by turbidity caused by one of the frequent storms.

After a lengthy ride through the throat of the Ponsul, tectonics bent or cracked lines with taste, tasting every geological detail, each tiny as graceful plant perfectly adapted to its oligotrophic habitat, each vestige of a secular human presence of wise utilization of natural resources, with the construction of windmills and dams, it is worth to follow the two banks of the river. Downstream, a world of miniature gardens and a mounted made of secular trees. Upstream, a plan of water between quartzitic cliffs, superb landscapes by late afternoon or on winter days, accompanying the main tectonic directions, up to Salvador. Passing the pleasant Fonte do Cuco, there is another dimension, made of agricultural plan lands, perfectly frozen in time, ending with a great view over the Serra da Gata, with Vale Feitoso at your feet, a magnificent pine forest and game reserve, with desire to be an environmental Park with unique characteristics in Portugal. It is worth finishing in the high mountainous, from Ramilo to Gorda, west facing, and Cacheira with ancient iron mines, the Campo Frio, overwhelming vastness of the landscape to Erges and Serra da Malcata. Around here, Gryphons, Black Storks, Eagles and colored riparian glide.

Penha Garcia is made of stones and stories composing a vast landscape with 128, 42km<sup>2</sup>. To a traditional culture of great relevance and still present in their 748 inhabitants, is added a striking old history, made by military gest, fugitives, healers and smuggling. This culture still vibrates through the streets of the village through numerous local initiatives, highlighting however the pilgrimage of Senhora da Azenha and Eastern celebrations. Here you can eat good bread with traditional knowledge, the rye cake or the gazpacho at Penha Garcia's way. The Ichnologic Park of Penha Garcia became an international reference to the UNESCO Naturtejo Geopark of the Southern Plateau and the numbers don't lie, tourism grows every year as well as the quality of the accommodation offer. However, the animation throughout the year, outside of the events is missing. Fearless climbing rocks and adventure into the vertical ocean, schools from all over to learn in this great nature amphitheatre, tourists wearing quartzite Rails that seemed only to perish by the ancient affection of the Ponsul waters . In one of the best "Appalachians" reliefs of Portugal imposes the connection to United States of America through the International Appalachian Trail, the longest pedestrian trail in the world, with landscapes which complement each other in a wide range of latitudes. The tracks by the Penha Garcia Syncline are full of landscape and are convenient for hikers, MTB, off-road or trail run fans. The restaurants offer local flavors, but not venture on such gastronomic diverse culture of this land. Finally, with a valuable fossil record which translates a critical period to the evolution of life on Earth, we need to demonstrate the value of fossils of Penha Garcia through a large center of reference in Portugal dedicated to animal behavior.

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Cover: (Photo: Pedro Martins)

The Editor  
 Carlos Neto de Carvalho  
 Scientific Coordinator  
 Geologist



# MONTHLY ACTIVITIES



**1 to 29 July - Brazilian student internship in Naturtejo.** Victor Vasques, from Brazil, conducted a one month internship within the framework of his master's degree at Indiana University (Bloomington, IN) in the United States of America, on International Development and Management of non-governmental Organizations. Victor has developed work in the area of communication, marketing, geoproducts and management.



**1 July - Field trip in the Natural Monument of Portas de Ródão aimed at students from kindergarten of Santa Casa da Misericórdia of Idanha-a-Nova.** On this day, 24 children accompanied by two teachers held the boat ride through the Natural Monument of Portas de Ródão, to observe the flora, fauna and quartzitic rocks that form the magnificent Gorge in the Tejo river. The monitor of this activity was Hugo Oliveira.

**9 to 10 July - River Flavors Fair, in Santana.** This festival, centered on the Tejo Riverside cuisine, brought together the best dishes of fresh-water fish in the region, showing the great tradition of fishermen from Santana. A walk through Trilhos do Conhal, where visitors stroll through the traces of ancient Roman gold mine, operated by the force of the water and the Man, was organized.

**9 to 17 July - International Tennis Circuit.** The International Tennis Circuit in Idanha-a-Nova involved 112 athletes from 16 countries, namely United States, France, Italy, England, Portugal, Spain, Mexico, among others, in a series of two tournaments, organized by the Tennis Club of Idanha-a-Nova. This event was held in Termas de Monfortinho and counted on the support of Naturtejo Geopark.



**11 to 17 July - In the Assessment the first indigenous Geopark project, in Mexico.** Carlos Neto de Carvalho was on assignment in Mexico at the invitation of UNESCO to make the assessment of the project of Mixteca Alta of Oaxaca Geopark. During the days of assessment, well accompanied by the team of the UNAM (University of Mexico), the evaluators of UNESCO felt well near the enthusiasm and involvement of local communities in the various municipalities that make up the territory of the Geopark, as well as the difficulty of the Mixtecan dominant community in asserting itself in the national context, located in one of the poorest regions of Mexico. The theme of this project is "Erosion, Culture and Geological Heritage" and represents a geologic landscape of great interest in strong interaction with an ancient agricultural culture that here remains for more than 3500 years. The project shows great consistency and developed work, and the aspiring Geopark has great potential to demonstrate as indigenous culture and identity can, through its geological heritage and its relations with a ubiquitous landscape that always conditioned their traditional activities, succeed in sustainable and responsible development of their communities. The strong involvement of the communities and the pride in their culture, with their own language that goes missing, with forms of mutual help and social work known as "Tequio", are the main driver of the Mixteca Alta, project of a real Geopark project with a "bottom-up" administration.



**11 July - Archaeologists study the history of Tin mining.** A group of German and Portuguese archaeologists and geologists, dedicated to the study of materials and coordinated by Dr. Elin Figueiredo, visited the UNESCO Naturtejo Geopark, with the aim to meet some places where Tin was exploited in the past. They visited the old mines of Mata da Rainha, located on the border of Penamacor, Fundão and Idanha-a-Nova, extremely important during World War II, for the exploitation of tungsten and tin, where they observed galleries, heaps, some ruins and traces of tools. After lunch, in the Centre of Penamacor, they visited the exhibition "Archaeological Chart of Penamacor" in the Municipal Museum. The afternoon continued with tin mining, on Ribeira do Casteleiro, a placer which was once exploited in the 20th century, for obtaining Tin and Tungsten.



**11 to 13 July – Geopark on the 3rd International Meeting House of Sciences .** The “Casa das Ciências” (House of Sciences) performs for the third time its meeting with aims, first of all, responses to the Science education in the context of the current society. Since 1997, release date of the “Green book for the information society ”in Portugal, that the concern to integrate digital solutions in teaching/learning models is part of the concerns and analysis of all engaged in Education in Portugal.

The problem of science education in this context takes particular relevance, whether the proliferation of information, which is not at all reliable, or accessible information for all - and indeed by students – it's really deviating on scientific knowledge point of view. The House of Sciences comes precisely in an attempt to meet certified, or better saying, validated, in the best way that the scientific community can, the needs of digital solutions to support teachers who teach Science, particularly in years of education arising upstream of universities.

Within this world that is today the Home of Sciences' project, we have been regularly gathering in a meeting of "people who teach Science", which crosses the entire educational community, since teachers of the 1st cycle to university professors, to discuss, debate, reflect and, of course, try to improve science teaching in Portuguese Language. As a result of what happened in the 1st and 2nd meetings, submitted to the themes “The use of digital resources in the context of learning and teaching and dissemination of science in the Digital World of the early 21st century”, the III meeting questions the Science Teaching for Knowledge Society, always with the Science as background, its learning and the use of technology as a support to improve this process. This year, we try to find a solution that, having a clear global coherence, has targeted routes for specific areas of each teaching group. Thus, there are panels, plenary meetings and workshops that are targeted to predetermined areas, either by group or by level of education, regardless of each participant have always the possibility to create their own journey in all solutions we present as diverse as possible.

The 3rd International Meeting House of Sciences, at the Instituto Superior de Engenharia do Porto, the largest gathering of teachers in the country, was attended by 600 teachers in the areas of Natural Sciences, Physics, Chemistry, Biology, Geology, Mathematics and Computers, who participated in plenary sessions, panels, workshops and communications. Joana Rodrigues boosted two workshops, both sold out, "Learning millions of years of Earth's history in the Naturtejo Geopark", one aimed at teachers of the first and second cycles and other at teachers of middle school and high school where teachers explored the program contents through examples of UNESCO Naturtejo Geopark, with activities and accessible materials. Naturtejo Geopark also contributed to the debate on "The field work and the motivation in Earth and Life Sciences ", with the example of their formal and non-formal educational contexts.

It was submitted, together with the Mines Route platform, the poster "Guide of Educational Services and school visits" from the "Mines Route and geological points of interest of Portugal" to promote the network of partners. The Naturtejo Geopark had an exhibition space over the 3 days of the meeting, together with the Mines Route, promoting its territory and activities.



**20 July - Workshop Activity "Tourist Information on the Naturtejo Geopark, UNESCO Global Geopark".** The receptionists of the Hotel Tryp Colina do Castelo, partner of Naturtejo Geopark, received specific training for the staff in the UNESCO Naturtejo Geopark. The training activity "Tourist Information about the Naturtejo Geopark" aims to present the diversity of the offer of 5000 km<sup>2</sup> of the Geopark, services, infrastructure, natural and cultural resources, as well as the structural concepts of Geoparks. The receptionists shared their experiences of contact with visitors, feedbacks, etc.. Carla Jacinto, André Nunes and Victor Vasques from Naturtejo Geopark and Ricardo Ambrósio from Rural Tourism Federation were also present. The monitor was Joana Rodrigues.



**20 to 24 July - Nature and Culture in Naturtejo Geopark.** A group of 30 American students enrolled in the program "Study in Portugal Network" accompanied by 4 adults (2 teachers) traveled during 3 days in the municipality of Idanha-a-Nova, inserted in the Naturtejo Geopark of the Southern Plateau to undertake a set of activities to meet its Natural and Historical-Cultural Heritage. These higher education students come from several universities in the United States of America and are studying, during the summer, in several Portuguese Universities. On the 22nd, the Group dined in the restaurant "Espanhol" where they heard some songs performed by the Group of Adufeiras of the Ethnographic Ranch of Idanha-a-Nova and hold and play the traditional instrument symbol of the municipality of Idanha-a-Nova, the Adufe (Moorish tambourine). On the 23rd, students participated in a workshop of building adufes in the Forum Cultural de Idanha-a-Nova, taught by technicians of the Arts and Crafts Centre. They visited the Mills complex of Proença-a-Velha, where the famous Bacalhau à Lagareiro (Codfish roasted with olive oil) was tasted for lunch and other delicacies produced and prepared by local cooks. In Penha Garcia, it was performed the Fossils Trail and subsequently indulged in with regional products in the coffee/bar "Frágua". At the end of the day they visited the Watermelon Festival in Ladoeiro. In the morning of 24th, the students visited the Inselberg and the historic village of Monsanto, held the Boulders Trail, ending with a lunch in the "Adega Típica o Cruzeiro". The monitors of this activity were Manuela Catana and Hugo Oliveira.





**22 July - Gold mining in Ocreza.** Already on vacation, 11 young people from a Study Center in Proença-a-Nova were dedicated to gold mining in Ocreza River, at Sobral Fernando. This refreshing experience introduced them the tools used by the ancient miners, the rocks of the region, the gold properties and let them experience the ancient gold exploration techniques, already used by the Romans. The activity was driven by João Geraledes and André Nunes.



**23 and 24 July - Watermelon Festival in Ladoeiro.** The summer flavors seized Ladoeiro, in the Watermelon Festival, with one more refreshing and lively festival dedicated to this fruit of the Naturtejo Geopark!! The festival was inaugurated by the Minister of Agriculture who had the opportunity to taste jams, juices, liqueurs, and various delicacies made of watermelon. The Watermelon Festival had great animation, music, crafts and a large watermelon market and other regional products. The long awaited contest to elect the heaviest watermelon, was won this year by a specimen with 19.44 kg. The Geolicores Acha Doce were sweetening the Watermelon Festival's visitors and also freshening up with the wonderful Liqueur Sangria, whose recipe is secret!



**26 July - Celebration of the 10th anniversary of Naturtejo Geopark back home.** The Ichneological Park of Penha Garcia was the stage to the celebrations of the 10th anniversary of the Naturtejo Geopark of the Southern Plateau – UNESCO World Geopark, with the presence of the Minister of Culture, Luís Filipe Castro Mendes. The minister praised in Lapa, a natural place where Naturtejo Geopark emerged, in 2003, “the connection between the community of Penha Garcia and the scientific project” which led to the creation of Naturtejo Geopark. “The scientific and the local communities met, aligned, working together, and that dynamism made the value of Naturtejo Geopark, recognized by UNESCO”, said the Minister, considering this a “great lesson”.

Luís Filipe Castro Mendes remembered the Naturtejo Geopark, currently with 5.000 km<sup>2</sup>, was the first in Portugal integrating the European and Global Geoparks Network, then under the auspices of UNESCO, today an official Program. According to Armindo Jacinto, president of Naturtejo and mayor of Idanha-a-Nova, “the great value of this project is on local populations being involved in the development, preservation and enhancement of the natural and cultural-historical heritage that characterizes them”. After 10 years we've come a long way, knowing we still have more to do and go, "he said.

So, the Municipality of Idanha-a-Nova honored, in these celebrations, all those who have contributed to the success of this territory and collaborate with Naturtejo. Was also honored Domingos Costa, an employee of the municipality, responsible for the Ichneological Park of Penha Garcia, which was in the genesis of this territory for its paleontological heritage UNESCO recognized internationally.

Among other individualities that joined the 10 years of the Geopark Naturtejo, highlighted by the Chairman of the UNESCO National Commission, Ambassador Ana Martinho, and Ana Abrunhosa, President of the CCDR Centro; Hortense Martins, member of the Portuguese Parliament, Pedro Machado President of Turismo do Centro de Portugal, Jose Maria Barrera and Javier Caballero, Coordinators of Geopark Villuercas in neighboring Extremadura, Antonio Carlos Duarte and Daniela Rocha, of Arouca Geopark, and yet the professors José Brilha and Mário Cachão, representing the ProGEO-Portugal and the academic community, who were at the origin of the Naturtejo Geopark project. In this event, the children of the after school center of Penha Garcia participated in the games "Fishing Trilobites" and the memory game "Animals of the Paleozoic". They sang the song "It is the Park, Naturtejo Geopark" together with Adufe players from Penha Garcia, at the time the Minister of Culture and other entities arrived to Gruta da Lapa. The 11 children of the after school center of Penha Garcia attended with 2 teachers. After the speeches, the delegation and locals took the Fossil Trail, with Armindo Jacinto and Carlos Neto de Carvalho as guides, responsible for the successful development of the first Portuguese Geopark. In the end, near Açude do Pego, the almost 100 participants had contact with some geoproducts and innovation combined with in traditional Portuguese gastronomy of Mario Ramos, in concerted action with the Management School of Idanha-a-Nova. A cake representing the continents about 500 million years ago, around the time that formed the rocks and fossils of Penha Garcia, a creation of Geocakes, ended the ceremony. Into the night there was a session of ancient music in the parish church of Penha Garcia to celebrate the day.



**29 de Julho - 29 July - Conference "Heritage of Earth and Man" in Proença-a-Nova.** This year, Proença-a-Nova hosts the Conference Praxis V dedicated to the theme "Heritage of Earth and Man: Enhance and Sustainable Development in Beira Baixa", organized by the Polytechnic Institute of Tomar, in partnership with the municipality of Proença-a-Nova and the Association of Estudos do Alto Tejo within the framework of the International Archaeological Field 2016. With the presence of a panel of honored guests, the themes focused on: "General Framework and Programs in the inter-municipal community of Beira Baixa" (Panel 1), and "projects and infrastructure in CIMBB" (Panel 2). The perspective of tourism linked to heritage has always been a theme in parallel discussion being that an engine of development for excellence in any territory. Carlos Neto de Carvalho made an introduction to the new Program UNESCO Global Geoparks, to Naturtejo Geopark and its tourism impact to regional development.



**29 July - Inter-generational Field trip to the Natural Monument of Portas de Ródão.** Different generations crossed into another visit to the Natural Monument of Portas de Ródão, where all could teach and learn. This field trip had 13 children accompanied by 3 monitors and 5 elderly accompanied by 2 technicians from the summer vacation centre of Rosmaninhal and Santa Casa da Misericórdia of Rosmaninhal. The monitor of this activity was Hugo Oliveira.



**29 to 31 July - Geopark in the Lynx Lands Fair in Penamacor.** Penamacor presents annually its local products, an event that aims to also disclose the Historical Centre of the village. On a date when many return to its origins, the fair also bet on animation, crafts and gastronomy of the region with traditional Inns. The Naturtejo Geopark presented the Tours by the Geopark, the Cultural Agenda for the coming months and fresh suggestions for summer by Sérgio Ribeiro and Victor Vasques. There was no lack of Geoproducts of the Geopark! The Geoliqueurs Acha Doce, Soaps Aromas do Valado and Geowine Súbito was promoting this unique territory.

# IMPACT OF GEOPARK IN MEDIA



## TV & Radio

11 July (Canal Extremadura (Espanha) – Programa Extra Tarde) – Gold Prospectors  
25 July (Beira Baixa TV) - Penha Garcia –Minister of Culture in the 10th anniversary of the Naturtejo Geopark

## Newspapers & www

9 July (Fugas – Supplement to Jornal Público) – Mines Route: down to the bowels of the Earth  
21 July (Reconquista) –Minister of Culture in the 10th anniversary of the Geopark  
23 July (Turisver) - Community funds make Naturtejo Geopark more attractive all year  
26 July (Beira News) - Government praises connection between local and scientific community in Naturtejo Geopark  
26 July (Beira News) – Minister praises connection between locals and Naturtejo Geopark  
26 July (Diário de Coimbra) – Ten years ago the first Portuguese Geopark in Beira Baixa was consecrated  
26 July - Community funds make Naturtejo Geopark more attractive all year  
26 July – (www.portugal-gov.pt) – Naturtejo Geopark “is a great lesson in partnership between the community of Penha Garcia and the scientific work”  
28 July (Reconquista) – Geopark is 10 years old – Minister praises territory  
28 July (Reconquista) – Land and Man Heritages – Proença-a-Nova hosts Praxis V

# SCIENTIFIC CONTRIBUTIONS FOR THE GEPARK AND THE GEOSCIENCES



- RODRIGUES, J. & FALÉ, P - Guia dos «Serviços Educativos e Visitas Escolares» do Roteiro de Minas e Pontos de Interesse Geológico de Portugal. III Encontro da Casa das Ciências. Livro de Resumos., Porto, 74-75

# PROMOTION FOR THE GENERAL PUBLIC



## Campanha de Verão

### Escavações Arqueológicas

25 de Julho a 14 de Agosto de 2016

- Campo 1: mamoa do Cabeço da Anta
- Campo 2: recinto muralhado do Chão de Galego

### Actividades de ar livre

30 de Julho, 1 e 8 de Agosto de 2016

### Conferências

6 de Agosto de 2016

Auditório Municipal (R. Manuel Martins d'Evora)

### Contactos para informações:

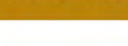
939 127 478 (Câmara Municipal)

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MESOPOTAMOS



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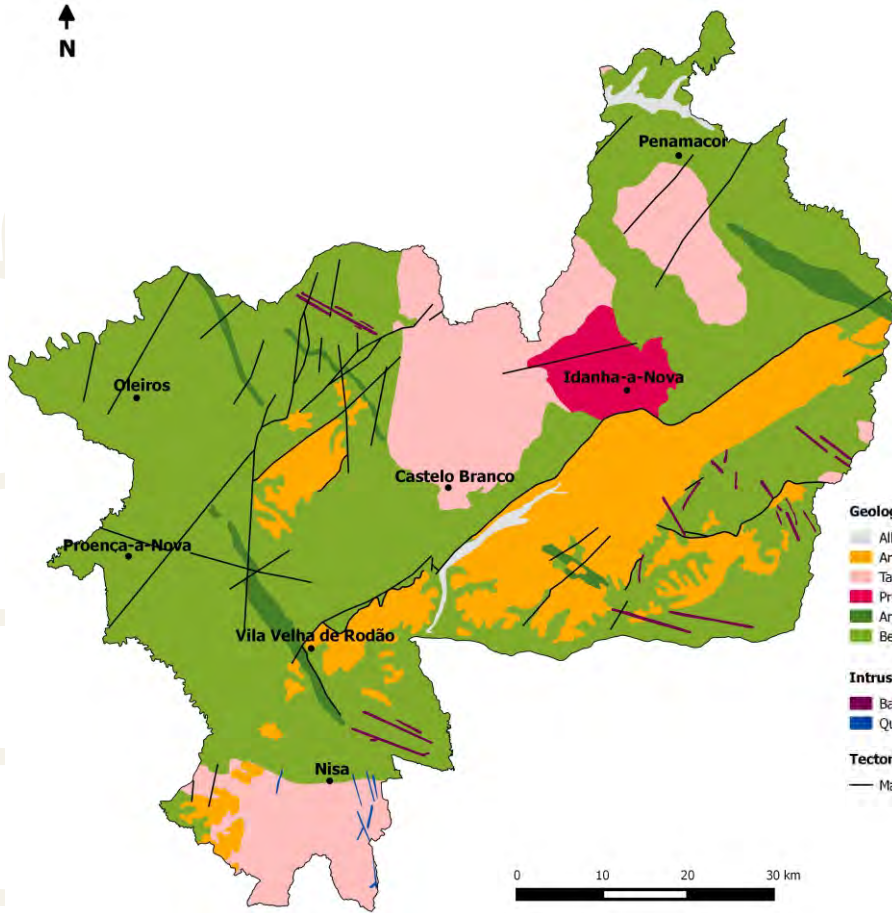
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**Geological Formations (Ma-Million years)**

- Alluvium and fluvial terraces - Plistocene-Holocene (1Ma-present)
- Arkoses, breccias and conglomerates - Eocene-Pliocene (50-2.6Ma)
- Tardi-Variscan orogenic granites (315-300Ma)
- Pre-Variscan granodiorites (480-472Ma)
- Armorican Quartzite and schists - Ordovician-Lower Silurian (488-435Ma)
- Beiras Group (schists and greywackes) - Neoproterozoic (610-542Ma)

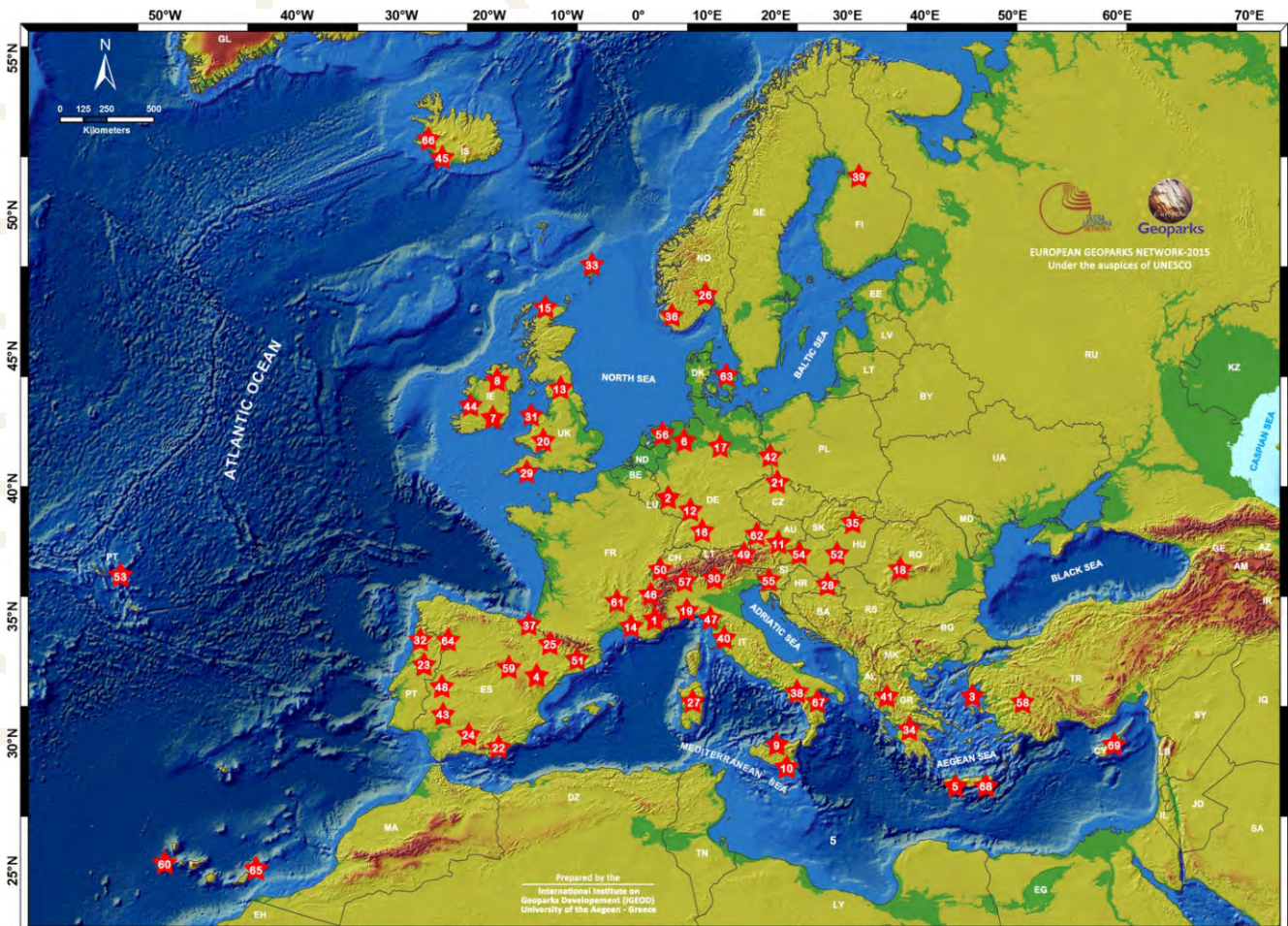
**Intrusive rocks**

- Basic rocks, aplites and pegmatites
- Quartz

**Tectonic**

- Main faults

## Geoparks: Geology with human face







Edition - Geopark Naturtejo, 2016  
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Clipping - Alice Marcelo e Carla Jacinto  
Translation - Carla Jacinto  
Design - Layer [Design and Print Studio]  
Montagem - Joana Rodrigues



**CRUZIANA**

GEOPARK NATURTEJO DA MESETA MERIDIONAL EUROPEAN AND GLOBAL GEOPARK MONTHLY REPORT

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