

Editor's note

Points of interest:

- The salt pans from Andalusia
- The "Tuna" and the almadrabas

Borders, boundaries

Borders and boundaries are concepts that are difficult to establish and most of the time they are mere conventions which establish a certain point, a certain line. In Ecology borders are always tenuous and are rarely continuous, there are always interactions between areas; populations that belong to one and to the other side.

Our character for this issue - the Atlantic bluefin tuna - is a good example, but many more might be singled out, particularly the birds which even if we consider the geographical area of our project alone (from Brittany, the United Kingdom to Andalusia) there are populations which breed in the north and spend winter in the south. In addition to those that are naturally long-distance migrators, and use the wetlands of the Atlantic as crossing points between their nesting areas in the Arctic and their winter quarters in Western Africa.

But "invisible" boundaries have always existed. Exchanges and transfers were made up to a certain point. In the expertise related with salt pans, the techniques followed the weather elements with regard to temperature, humidity, sunshine and rainfall up to certain limits, which gave preference to certain techniques instead of others.

There are certainly boundaries - but there is surely also - overlap between the techniques of simple solar evaporation and those of forced evaporation. In the former the difference between the various small harvests per week of the northern technologies and the large harvests, made only 2 to 3 times per season, of the southern technologies; these are also related to the elements of climate and the boundary lies in the Tejo Estuary.

If the isolation of the past prevented some exchanges and transfers, globalization has also borne fruit, because, nowadays, products like fleu de sel and samphire, virtually unknown and unfamiliar to the eating habits of the Portuguese and Spanish, are already exploited in many of the Iberian salt pans, and intended not only for the foreign market.

The Andalusian coast marks a border, but beyond it there are elements that bind us, both in history and in culture. ATLANTIS ECOSAL seeks these connections and the running of Jornadas de Estudo (workshops) on the salt pans of the Atlantic, in Larache and Azilah (Morocco), in close collaboration with the University of Larache and the Fisheries Department, has indicated the desire of extending boundaries.

Inside this issue:

Editor's note	1
The Andalusian salt pans	2
Character	6
Events	7

Renato Neves
National coordinator of ECOSAL ATLANTIS in Portugal

The Andalusian saltpans

Andalusia retains a rich salt-producing heritage, where age-old installations and modern spaces co-exist, where Man and Nature live together in spectacular scenery in one of the regions with most biodiversity in Europe. The ECOSAL project aims to enhance the Andalusian salt producing heritage, promoting sustainable development in these areas and boosting activities such as ecotourism

Main characteristics of Andalusian salt

- Unlike other countries and regions with deposits of rock salt, the salt obtained in Andalusia relies on evaporation techniques
- The main salt works of Andalusia (with regard to the production of salt) are located in Huelva (del Odiel Marshes), Cádiz (Sanlúcar de Barrameda, Puerto de Santa María and San Fernando) and Almería (Cabo de Gata).
- The Andalusian production share represents 11.5% of the Spanish quota, although in the case of sea salt that percentage amounts to 30% of the national total.
- In the Andalusian zone that borders the Atlantic there are 114 saltpans catalogued: 78 in Cadiz (8 in the hinterland, 70 on the shore, 13 of which are dedicated to the production of salt and two to marine cultures), 21 saltpans in Huelva (all coastal, 4 produce salt and 3 are dedicated to marine aquaculture) and 12 in Seville (naturally all in the hinterland, 5 of which produce salt)
- The Andalusian saltpans are home to a wide variety of plants and animals of marine origin. Birds are the most abundant animals

on the saltpans, as these saltpans provide them with a suitable habitat for reproduction. Furthermore, in Andalusia one finds the convergence of two migratory flight paths, so the Andalusian saltpans provide them with a suitable habitat for feeding and resting during the migration period

- Andalusia is home to some of the most important coastal wetlands for breeding waterfowl in Europe: the marshes of Doñana, of Odiel and the Bay of Cadiz. For example, more than half of the effective reproducers of the Pied Avocet (*Recurvirostra avosetta*) and Kentish plover (*Charadrius alexandrinus*) breed in Spain in the Andalusian saltpans, and other emblematic species such as the flamingo (*Phoenicopterus ruber*) or spoonbill (*Platalea leucorodia*) breed in Andalusia, in salt pans that were abandoned or adapted for other uses.

In recent months, one of the ECOSAL ATLANTIS project partners: Andanatura Foundation, signed collaboration agreements with four Andalusian salt works for the expansion of this project.

CENTRO DE RECURSOS AMBIENTALES SALINAS DE CHICLANA

Apartado de Correos 308

CP. 11130, Chiclana de la Frontera, CÁDIZ (España)

The Environmental Resource Center "Salinas de Chiclana" offers a unique opportunity to see up close how a traditional salt works functioned as well as some old jobs related with this almost extinct activity

Situated in the Bay of Cadiz Natural Park, this centre has an area of approximately 30 acres that include numerous natural and cultural resources with enormous interpretive and educational potential

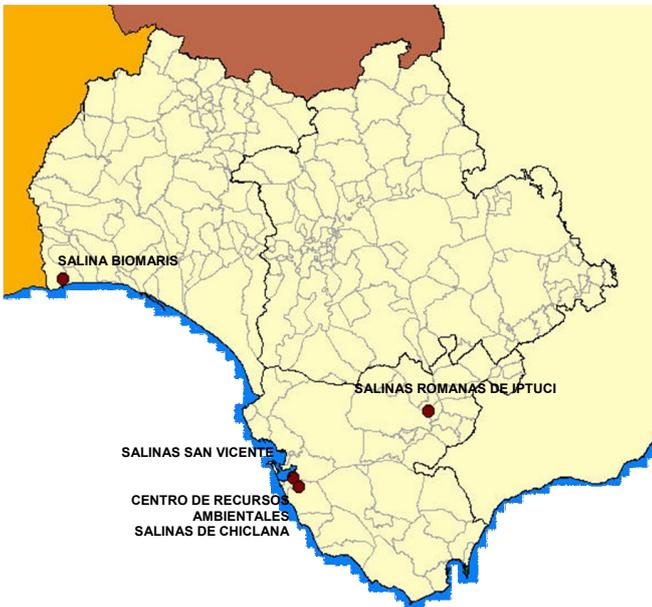


Figure 1 - Map showing the location of four Andalusian saltpans participating in the ECOSAL ATLANTIS Project.

The center has a rehabilitated traditional coastal salt works, called Santa María de Jesús, that has recovered part of his natural countenance in the various components, for regulating the water system and for artisanal salt extraction

This salt-works includes two marshes that hold optimum conditions for their use as educational resources as well as for use in traditional saltpan marsh aquaculture, allowing the entry of fry from the arms of connection canals, with the help of the tides, leading to the fattening of bream, sea bass, flounder, eels and mullet with natural products originating in the wetlands.

This facility also has a traditional salt house which has been completely renovated and opened to the public with the intention of showing the daily life of the salt-worker and the main tools and utensils

This center and all its facilities allow Alema Turismo y Medioambiente SL (a local company for Environmental Education that directs the Center) to develop a plan of action, dedicated to environmental education, for public use and for the conservation of this ecological and cultural heritage

In this way, the Environmental Resource Center "Salinas de Chiclana" offers the possibility of taking part in a wide range of activities related with the salt pans and with the natural and cultural resources of the Bahía de Cádiz Natural Park (salt related activity, traditional aquaculture, saltpan architecture, the transformation of the landscape and environments, the Bahía de Cádiz as unique coastal location, etc.). Some of these activities are for school goers and young people (camps, volunteer environment camps, environmental education workshops, drama ...) and others are for the general public, especially the restaurant, which offers despesque (capture and preparation of the fish caught in marshes at the end of the salt harvest) scheduled for groups, and the bird observatory located on the salt pans



Figure 2 – Salina Chiclana, Salt-worker's house.



Figure 3 - Salina Chiclana, Environmental Resources Center



Figure 4 – Salina Iptuci, panoramic view

SALINAS ROMANAS DE IPTUCI

Ctra. Arcos - El Bosque, Km. 25

CP. 11660, Prado del Rey, Cádiz (España)

With a modest size of 1.5 hectares, these salt pans are located in the Gaditano municipality of Prado del Rey, within the Alcornocales Natural Park and a sector adjacent to the Sierra de Grazalema Natural Park. These are located on a plain between mountainous reliefs around the del Bosque River basin (a tributary of the Guadalete), at the foot of the hill of Cabeza Hortaleza, original site of the Ibero-Roman city of Iptuci

This is the only salt works which is fully operational in the province of Cadiz and, despite its sparse territorial representation and its modest size, it embodies a system of great originality and uniqueness, with great cultural, ethnological and environmental value

They owe their existence to salt water springs that flow nearby and sprout water throughout the year, at an average temperature of 25 ° and with a salt content of 28 g / l. The brackish and ferrous nature of these springs is due to the fact that before the water, springs, it

flows through Triassic materials of an alluvial clay nature which is rich in soluble salts

The spring water is conducted (via ditches, culverts and canals) to the heating tanks, and then to crystallizers. These stone tanks, where water evaporates and the salt is harvested is more than two thousand years old, and the current managers have recovered the abandoned ones.

These salt pans were exploited by the Phoenicians and, although they had their prime in Roman times, they owe their name to a nearby town, Iptuci

They have remained active since that time, and are currently a family concern that has as its star product fleur de sel, that is very popular in European markets for its purity. This specialization allows for a profit from the salt pans, although their productive activity has declined from 500 tons of salt in the mid twentieth century to just over 100 tons, nowadays

The Roman Salt works of Iptuci were recently rehabilitated and are now open to the public and equipped for the visit of tourists, travelers and the generally curious who want to discover a unique way of using natural resources.



Figure 5 - Salina Iptuci, view of the crystallizers from the trail.



Figure 6 – The San Vicente Salt works, Events Hall

SALINAS DE SAN VICENTE

Ctra. Arsenal de la Carraca, 48

CP. 11100, San Fernando, Cádiz (España)

Civilizations as old as the Tartessians, the Phoenicians or, later, the Romans conceived smaller sized salt pans for the Bay of Cadiz, thanks to the presence of constant strong winds like the "levante" or "poente" which greatly facilitated the evaporation of sea water.

Within the area of influence of the Bay of Cadiz Natural Park, the Salina de San Vicente is one of the oldest, and the only one that remains active in the city of San Fernando, the salt-producing hub of activity for centuries in southern Spain. Managed by the Ruiz family since 1771, the more traditional craft methods of production and collection are still used here.



Figure 7 – San Vicente Salt works, products

Salt production is currently going through a redirection process of its activity in San Vicente, gearing up now for the hotel sector and gourmet stores. A few years ago the marketing of fleur de sel began, which is now presented in a small jar with a mill that grinds the crystals before serving. Mixtures have also been developed with fleur de sel, spices and other products from the region. These new products are designed to flavour many dishes, among which fleur de sel for fish, meat or salads, fleur de sel with red wine, smoked fleur de sel and black fleur de sel.

Besides the production of salt, San Vicente also promotes other activities related with salt: Despesque of the estuaries, to catch, with a net, the fish that come naturally into the pans.

Catering is the third pillar of economic activity in San Vicente, with a restaurant and an events-hall that specializes in fish from the estuary, cooked in the traditional way on coals, as well as other produce from the land.

In recognition for their work, in recent years this company won the Award for Sustainable Development (Fundación Andanatura) 2007 edition, the award of Tradition and Innovation in Andalusian cuisine in 2007, with the recipe Atún de la Almadra encebollado, salsa garum y Salicornia de salina, The Almerna 2008 prize (awarded by Publicaciones del Sur), and the Catalán Vichy waters prize for the second best recipe

SALINAS BIOMARIS (FLOR DE SAL - SALINAS DE ISLA CRISTINA)

Ctra. Pozo del Camino,

CP. 21410, Isla Cristina, Huelva (España)

Situated in the Paraje Natural Marshes of Isla Cristina, in the south-western province of Huelva, these traditional salt works have an extension of 15 hectares and are the only ones that continue to work the bara in the traditional way, from the 22 in existence in the province of Huelva

The company was founded in 1954 and directed by a former spy of the Second World War, known as "Juan El Alemán". Since 1995, they are managed by D. Manuel Gómez Rodríguez, who, a few years ago, passed the management on to his daughter, Manuela Gomez Santana, who now directs it.

Initially, the salt obtained was destined for the chemical and cosmetic industries of Germany, for which they worked with 2,500 clay bowls. Subsequently, Biomaris Fleur de Sal entered the food market, selling gourmet products and becoming the first Spanish producer of fleur de sel. Currently it markets fleur de sel with various flavours, obtained by mixing it with barbecue sauce, onion, curry sauce, etc.

Its current production also includes salt flakes (that taste somewhat more intense than fleur de sel, more consistent and appealing) and concentrated edible liquid salt, with the same components as artisanal salt. Finally, for topical use, it markets magnesium oil, a product indicated for treating various diseases of the skin such as psoriasis.

The company "Flor de Sal Salinas de Isla Cristina" collaborates with universities, associations and other entities on various research projects, and organizes training activities and environmental education, in addition to offering guided tours of their facilities.



Figure 8 – Biomaris Salt works, heating tanks.



Figure 9 – Biomaris Salt works, salt flakes

Fundación Espacios Naturales Protegidos de Andalucía (ANDANATURA)

Character

"Tuna"

Between two seas, between two continents, the Iberian Peninsula is an ancestral place of crossing routes, peoples, populations, cultures and influences. The boundary between the "Atlantic character" and the "Mediterranean character" is sometimes very faint and diffuse, and cannot be expressed by any parallel or meridian.

These interactions are particularly interesting in the case of an activity with a huge economic importance in the history of the Algarve and Andalusia - tuna fishing by means of frames or Almadrava (Almadraba in Spanish, in both cases with an Arabic root - another interaction) .



Figure 1 - Atlantic bluefin tuna – *Thunnus thynnus*.

Each year the Atlantic blue fin tuna (*Thunnus thynnus*), spawn in the western Mediterranean, coming together in huge shoals that converge on the Strait of Gibraltar; an adult tuna can measure between 2 to 2.5 m and weigh 150 to 300kg, however some specimens of about 4 m and 1,000 kg can be found.

No one knows exactly when organized tuna fishing on a large-scale started, it was probably already carried out in the important Phoenician colony of Cadiz, the truth is that as from the fourteenth century, references to Almadrava from the Algarve and Andalusia already abound, which represented a important source of revenue for the courts of Portugal and Spain. It is also interesting to note that at least in the case of Portugal, at the beginning of this period (until the seventeenth century) the Almadrava were often exploited by the Sicilians and Genoese.

It is unclear just how many Almadrava functioned simultaneously in this period, probably about 40, or what the figure of the annual catch was. However through indirect means we know that there were thousands of men involved in this activity and, as for the catch, it is illustrative to note that in 1499 a royal order was issued from Lisbon for the construction of sinks, in Lagos, for the salting of tuna which could hold 3,000 tuna.

The conservation of such large quantities of fish required enormous amounts of salt, and the saltpans of the Algarve and Andalusia experienced a significant development in this period. For this reason the history of Almadrava is also closely linked to the history of salt.

With the advent of liberalism and capitalism the old aristocratic privileges went over to major companies such as the Companhia das Pescarias do Algarve and the Consorcio Nacional Almadrabetero, and the authentic Almadrava were set up, requiring extensive facilities on land, where the nets, ropes, anchors, buoys and boats were kept, repaired and stored, settling on the seashore and remained there from May to August. They were true tuna villages, which often led to the establishment of localities.

But over fishing, possibly in combination with other causes, led to a progressive decline in catches, with one of the last Almadrava of the Algarve catching a single tuna in the last campaign (1972), when this same Almadrava had recorded annual catches of about 40,000 tuna, in the early twentieth century.



Figure 2 - Tuna catch in a Andalusia Almadrava.

The plight of the populations of several species of tuna of the Atlantic and Mediterranean Sea led to the creation of an international regulation organization for the fishing of these species, the ICCAT, which recommends that the total catch of different species in the Mediterranean Sea (including Atlantic migrators) be around 15,000 tons per year.



Figure 3 - Tuna catch in a Andalusia Almadraba (details).

Currently the Almadrava are not just a memory. Every year one is set up in the Algarve and four in Andalusia, which perpetuate an ancient history and culture, and although catches are much more modest the market is substantially more demanding, because the Atlantic blue fin tuna, once placed in barrels and cans, is now carefully prepared, destined mainly for the Japanese market, to be consumed as sushi and is considered superior to the tuna from the Pacific. We now have to promote fleur de sel and traditional salt of the Atlantic as a condiment for this dish. In this way tuna and salt will remain, as ever, closely linked.

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National coordinator of ECOSAL ATLANTIS in Portugal

Events

The Santiago da Fonte Salt-works

University of Aveiro, July 20, 3 and 17 August 2011

On 20 July, and 3 and 17 August, visits were made to the Santiago Salt-works, for a total number of 40, 28 and 21 participants respectively, within the framework of activities on holiday camps organized by the Culturalia Travel Agency, for young people between the ages of 6 and 18. These young people were able to get to know the methods in the artisanal production of salt, as well to find out about the biodiversity that exists in this space.

University of Aveiro



