

## MEDICINAL AND AROMATIC PLANTS - IBERIAN PENINSULA

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### Summary

The aim of this chapter is to give a guide for the uses of traditional medicine plants in the Iberian Peninsula. 38 commonly medicinal species employed in this geographical area have been selected in this work. For each plant a small technical monograph has been prepared including scientific name, common name (English, French, Deutsch and Spanish), botanical description, location, part used, chemical composition and pharmacological indications. In addition, for each species a distribution map on the Iberian Peninsula has been included. An updated and extensive literature review has been performed for the preparation of these monographs.

### 1. Introduction

Iberian Peninsula is a territory of 583,254 km<sup>2</sup> located on the south-western tip of European continent, and includes the countries of Andorra, Portugal and Spain, with a total population above 58 million. The Iberian Peninsula separates the Atlantic Ocean from the Mediterranean Sea. The Pyrenees form the northeast edge of the peninsula, separating it from the rest of Europe. In the south, it approaches the northern coast of Africa. Relief, climate, soil and human activities influence the distribution of the vegetation all over the Iberian Peninsula.

The Iberian Peninsula is a mountainous area, and for this reason the modifications imposed by the relief and the topography are very important. It is particularly evident the variation of the mountain vegetation, depending on the orientation of the hillsides (sunlight and shade) and the effect of rain. The most important mountainous systems of the Iberian Peninsula are: Cordillera Cantábrica, Pyrenees, Sistema Ibérico, Sistema Central, Montañas de Toledo and Sistema Bético. Flat zones like Meseta Norte, Valle del Ebro, Meseta Central, Meseta Sur y Valle del Guadalquivir remain fragmented by these mountainous systems.

In general, at least four different climate zones have been described (Ninyerola et al, 2005):

- The **Oceanic Climate** predominates over northern coast and the north-western region, characterized by mild temperatures and high precipitation throughout the year.

- The **Mountain Climate** exists in areas such as in the north (Cordillera Cantábrica), northwest (Pyrenees), and other southern mountain ranges (Sistema Central, Sierra Nevada, Cordillera Bética). These areas are characterized by cold winters and mild summers, with a predominance of cold temperatures.
- The most predominant climate is **Continental Climate**, as it affects most of the peninsula's surface area (excluding its coasts and mountain ranges). This climate zone has cold winters with snows, frequent rainfalls in late spring and hot summers.
- The **Mediterranean Climate** is active over nearly the entire southern and eastern coast. Winters are generally mild and summers vary in intensity depending on the region. For the most part, temperatures are moderate and there is not a wide range between the summer highs and winter lows.

Of the different types of soils described in the Iberian Peninsula, it is possible to highlight five of them as the most important (Soil Taxonomy, 1999):

- **Inceptisol** is the most common type. This is a very young type of soil with a high content of organic matter, located all over the territory.
- **Aridisol** is a typically saline or alkaline soil with very little organic matter. It is found in arid regions like the basin of the Ebro River and the Spanish regions of Albacete, Murcia and Almería.
- **Alfisol** is a fertile soil of humid zones that occurs especially where native broadleaf forests were established, and is highly productive for agriculture. It is distributed principally in west Pyrenees and mid-south west.
- **Entisol** is a fertile soil of recent origin and it is found in high levels, flat areas of the Mediterranean coast and in river valleys.
- **Spodosol** is an acidic forest soil of low fertility, common to the south-west of Portugal.

The combination of these climatic, topographic and geological variations produces a very complex and heterogeneous landscape. As a result the Iberian Peninsula is one of the most interesting and richest in Europe, as well as countries with a Mediterranean climate.

The Iberian Peninsula is divided into sixty one provinces, 50 belong to Spain and 11 to Portugal. The provinces did not serve an administrative function, although they did mark the differences in habits, linguistic peculiarities and socio-cultural characteristics. Andorra officially the Principality of Andorra is a small landlocked country in north-western Iberian Peninsula, located in the eastern Pyrenees Mountains and bordered by Spain and France. It is the sixth smallest nation in Europe having an area of 468km<sup>2</sup> (Table 1).

<b>SPAIN</b>							
<b>A</b>	Alicante	<b>Cs</b>	Castellón	<b>Ma</b>	Málaga	<b>Se</b>	Sevilla
<b>Ab</b>	Albacete	<b>Cu</b>	Cuenca	<b>Mu</b>	Murcia	<b>Sg</b>	Segovia
<b>Al</b>	Almería	<b>Ge</b>	Gerona	<b>Na</b>	Navarra	<b>So</b>	Soria
<b>Av</b>	Ávila	<b>Gr</b>	Granada	<b>O</b>	Asturias	<b>SS</b>	Guipúzcoa
<b>B</b>	Barcelona	<b>Gu</b>	Guadalajara	<b>Or</b>	Orense	<b>T</b>	Tarragona

<b>Ba</b>	Badajoz	<b>H</b>	Huelva	<b>P</b>	Palencia	<b>Te</b>	Teruel
<b>Bi</b>	Vizcaya	<b>Hu</b>	Huesca	<b>PM</b>	Islas Baleares	<b>To</b>	Toledo
<b>Bu</b>	Burgos	<b>J</b>	Jaén	<b>Mll</b>	Mallorca	<b>V</b>	Valencia
<b>C</b>	La Coruña	<b>L</b>	Lérida	<b>Mn</b>	Menorca	<b>Va</b>	Valladolid
<b>Ca</b>	Cádiz	<b>Le</b>	León	<b>Ib</b>	Ibiza	<b>Vi</b>	Álava
<b>Cc</b>	Cáceres	<b>Lo</b>	La Rioja	<b>Po</b>	Pontevedra	<b>Z</b>	Zaragoza
<b>Co</b>	Córdoba	<b>Lu</b>	Lugo	<b>S</b>	Cantabria	<b>Za</b>	Zamora
<b>CR</b>	Ciudad Real	<b>M</b>	Madrid	<b>Sa</b>	Salamanca		
<b>PORTUGAL</b>							
<b>AAI</b>	Alto Alentejo	<b>BAI</b>	Baixo Alentejo	<b>DL</b>	Douro Litoral	<b>R</b>	Ribatejo
<b>Ag</b>	Algarve	<b>BB</b>	Beira Baixa	<b>E</b>	Estremadura	<b>TM</b>	Trás-os- Montes
<b>BA</b>	Beira Alta	<b>BL</b>	Beira Litoral	<b>Mi</b>	Minho		
<b>ANDORRA (And)</b>							

Table 1. Provinces of Iberian Peninsula.

Human activities like urbanization, deforestation, introduction of new species, agriculture, livestock and many other activities causes a loss of biodiversity including the medicinal plants. All of these factors determine the distribution of the medicinal and aromatic plants of the Iberian Peninsula.

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Associate Editor of Pharmacognosy Magazine and Pharmacognosy Research. Reviewer for Food Chemistry, Pharmacognosy Magazine, Pharmacognosy Research and Journal of Young Pharmacists. Resercher at Rural Institute “Valle Grande” (Peru) (1999-2000). Project of the Spanish Agency of International Cooperation (AECI) titled "Exploitation of Medicinal and Aromatic Plants for the Sustainable Development of Nor-Yauyos (Peru)", developing labours of quality control of autochthonous cultures and species, valuation of samples and posterior commercial development. Recovery of traditional Peruvian medicine information. Installation of a Pharmacognosy Laboratory for the quality control of medicinal plants.

**Rita Yolanda Cavero**, The main areas of research are studies of: i) the elemental concentration along the agricultural cycle in important horticultural crops of Navarra (pepper, artichoke and thistle), ii) studies of vegetation regeneration after forest fire, iii) seed bank and seed germination; iv) environmental education projects (demonstration and awareness, good practice guide); and v) Ethnobotany studies focusing on medicinal plants and pharmaceutical applications. As fruits of this research she has written 66 scientific publications and three Botany books and presented 70 communications in national and international Congress. Also, she has directed 7 Doctoral Theses and other 7 scientific works; and participated as a researcher in 9 research projects.

Her teaching has been conducted in the Faculty of Sciences and the Faculty of Pharmacy, giving courses of Botany, Biodiversity of Vascular Plants and Plant Biodiversity of landscapes to graduate students of Biological Sciences and Pharmacy degree students. In addition, she taught 7 PhD courses, and she has organized various events, to highlight: 2 courses of Botany for allergists; 1 theoretical and practical course of Medicinal Plants; 1 summer course of the evolution of vascular plants; 1 international course of Phytopharmacology, among others.

**María Isabel Calvo**, Professor at the Faculty of Pharmacy (University of Navarra), teaching Pharmacognosy and Phytoteraphy to degree students, and several post-graduate specialization courses in “Doctoral program in Biopharmacy, Pharmacology and Drug Quality”, “Official Master’s Degree in Pharmaceutical Technology and Biopharmacy”, and “Specialization in Industrial Pharmacy and Pharmaceutical Technology (Preparation for National Pharmacy Board Exams)”.

The main areas of research are: i) Search for new natural products with antioxidant, anti-inflammatory, anticancer and anti-acetylcholinesterase activity from plants used in traditional medicine; ii) Selection of plant extracts with high antioxidant capacity for incorporation into the formulation of sausages; iii) Quality control of medicinal plant cultivation. This research has been reflected in numerous scientific papers with high impact factor in the area, books and communications in national and international Congress.