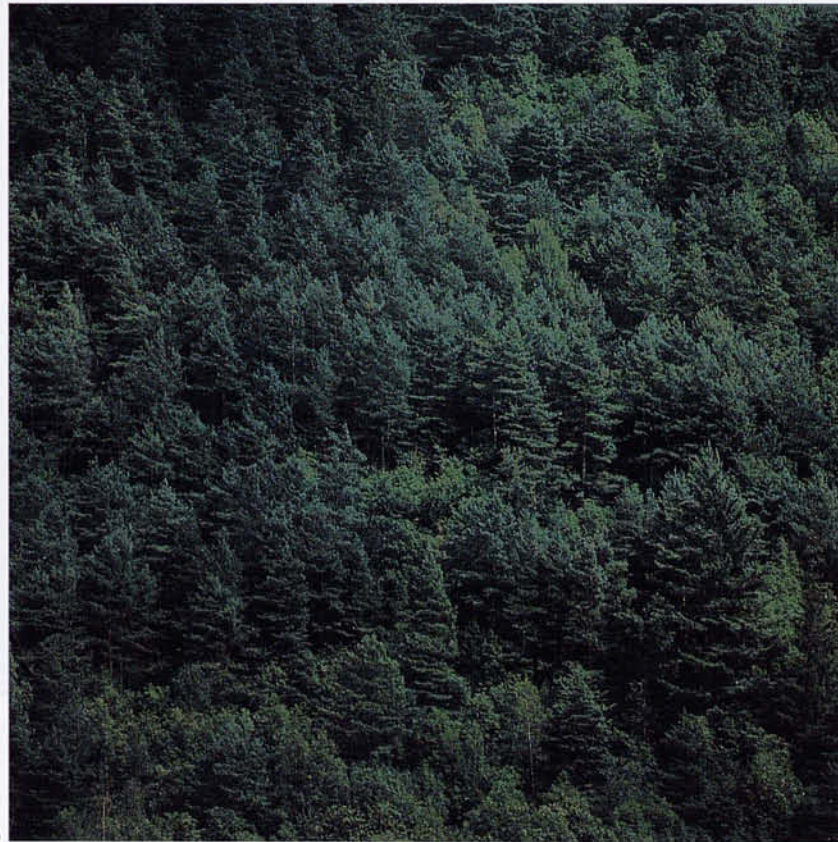


# AN OVERALL VIEW OF THE PYRENEES



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THE PYRENEES STRETCH THE LENGTH OF THE ISTHMUS THAT SEPARATES THE IBERIAN PENINSULA FROM THE REST OF EUROPE AND FORM A NATURAL BARRIER WHICH HAS HAD A DECISIVE INFLUENCE ON THE DISTRIBUTION OF FLORA, ON THE SHAPING OF THE PRESENT CLIMATE AND LANDSCAPE AND ON HUMAN MIGRATION ROUTES AND THE ESTABLISHMENT OF DIFFERENT PEOPLES AND CULTURES ON ITS SLOPES.

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**T**he Pyrenean range, rising from the tertiary folds, is one of the great mountain systems that extend across the centromeridional regions of Europe and which —the Alps being the most typical example— are known as Alpine mountains. The natural history of the Pyrenees is in fact closely related to that of the other Alpine ranges, and they are often compared and their similarities and differences underlined.

The Pyrenees stretch the length of the isthmus that separates the Iberian Peninsula from the rest of Europe and form a natural barrier which has had a decisive influence on the distribution of flora since the end of the tertiary and on the shaping of the present climate and landscape, as well as on human migration routes and the establishment of different peoples and cultures on its slopes. They are about 430 km long, from the Cantabrian to the Mediterranean, and about half of this length (230 km) forms the ceiling of Catalonia. The highest peaks are more than 3,000 metres above sea level (Aneto 3,404 m, Pica d'Estats 3,140 m, Mont Perdut 3,355 m).

One's first impression on seeing the Pyrenean range is of a regular and symmetrical system stretching more or less east-west in a practically straight line, with a central axis lined on either side by pre-Pyrenean ranges and a fairly ordered distribution of geological terrains. But

there are a series of phenomena imposed on this apparent symmetry which introduce a diversification and even sharp contrasts. Most descriptions of the Pyrenees underline this asymmetrical aspect, as if wanting to correct the initial impression of regularity. From the point of view of the flora, the most important factor in the diversification of the Pyrenees is the climate, and the most outstanding aspect of the climate is the difference between the system's two faces. The northern face receives the Atlantic disturbances, which provide it with an abundant supply of water, while most of the southern slopes and almost all the Ebro depression are dried by the effect of the descending winds. Within Catalonia, however, there are other climatic differences. The proximity of the Mediterranean leads to a fairly high rainfall at the eastern end, south of the line stretching from the Canigó to the Cadí, so that all the regions to the south of this line (Vallespir, Garrotxa, Ripollès and Berguedà) have a fairly damp climate, with the rainfall concentrated mainly in spring and summer. In this area the typically Mediterranean vegetation only penetrates a short way into the valleys; the vines and olives (very extensive crops in the nearby lowland) are practically inexistent there, and on the other hand, beech and other deciduous woodland abound, as well as soft grassland and,

along the river banks, alder woods. The Vall d'Aran has an even more extra-Mediterranean character. Situated at the westernmost end of the Catalan Pyrenees, it is in fact located on the northern slope of the range, within the area of influence of the Atlantic climate. The rest of the Catalan Pyrenean regions are subject to a more or less continental climate, a condition which is most evident in the upper reaches of the Segre and Tet rivers (Alt Urgell, Cerdanya and higher Conflent), that cut the range obliquely and form a sort of interior depression. In the continental valleys, there is a sharp contrast between the lower regions, with extensive oak woods (*Quercus rotundifolia*) and other xerophilous species, and the surrounding mountains, often having a high rainfall, and extensive woods of mountain pine and silver fir.

If, on top of this variety in the general climate, we take into account the differences that result from varying altitudes (drop in temperature and increase in rainfall with height) and from the uneven topography of the mountains, we get an idea of the range of environments contained within the Pyrenean landscape. Variety and contrast are, indeed, the outstanding characteristics of the plant population of the range.

The Pyrenean flora, a product of the *in situ* evolution of the plant species and





also, to a great extent, of the waves of immigrants in the finitertiary and quaternary eras, is remarkably rich. Of the total of known plant species in Catalonia (about 3,500), a good 75 % are present in the Pyrenees, and of these, a third is not to be found in the rest of the country. Of the elements that go to make up the Pyrenean flora, we shall first of all look at the boreo-alpine plants (about 6 %), which came from the northern regions of Europe during the quaternary ice-age and which at present also exist in the sub-Arctic countries and, leaving out a large area of Europe, in the higher Alpine reaches. In the high mountains, the Eurasian orophytes are also very important, and are a common factor of this and other Alpine regions and even of the Central Asian ranges. One must also mention an important showing of central European plants (more than a quarter of the flora)

which form the dominant vegetation of the mountain belt; a certain proportion of Atlantic plants, more abundant in the Pyrenees than in other Alpine ranges because of the geographical situation; and also an appreciable contingent (about 10 %) of Mediterranean species and Mediterranean orophytes that come from the dry peninsular lands. Finally, it should be pointed out that—as in the majority of mountain ranges—the Pyrenees contain a large number of endemic plants (over 100), that is to say, species that do not exist outside of the range. These endemic species are particularly abundant in the eastern end of the system, which is more or less the Catalan part.

The plant landscape of the Pyrenees, like that of most large mountains, can be said to be made up of a series of more or less well-defined areas or vegetation belts

corresponding to different altitudes, from the base of the range up to the highest peaks. Each of these belts is characterized mainly by its terminal community (the most mature and most stable), represented by woodland as far as the sub-Alpine habitat and by non-woodland formations above this level.

Leaving aside the typically Mediterranean vegetation that occupies the marginal areas, the following are, in outline, the main types of landscapes to be found in the Catalan Pyrenees. In the hill-belt, which corresponds to the lower areas, up to about 1,100 m, we find oakwoods, of pubescent oak (*Quercus pubescens*) in the eastern sector, and *Quercus cerrioides* in the more continental central sector. The pubescent oak is often found mixed with Scotch pine, which sometimes replaces it completely, while the forests of *Quercus cerrioides* share their habitat





with *Pinus nigra*. Agriculture has taken a lot of land from the primitive forests, and degradation of the woodland communities has led to the establishment of shrub and grassland, some of which, like the garrigue and the *Aphyllantion* pastures, are typically Mediterranean in character.

The mountain belt, from about 1,100 m up to 1,600 m, is the domain of the Scotch pine (*Pinus sylvestris*), which occupies large parts of the drier interior valleys, and also of the beechwoods, limited largely to the Vall d'Aran and a few moist eastern regions. The beechwoods are sometimes mixed with clumps of fir. The secondary vegetation consists of grassland, broom-bushes, boxwood, etc. The agriculture is made up largely of hay meadows that produce food for the farm animals. Both in this belt and in the hill belt, riverside forests (poplar groves and

alder woods) line the water courses in large numbers.

The most typical forest of the sub-Alpine belt (from about 1,100 to 1,600 m) is that of the mountain pine (*Pinus uncinata*), although there are also important forests of fir in the region. Apart from the vegetation of the rocks and screes, the secondary communities are represented mainly by thickets of rose-bay shrubs (*Rhododendron ferrugineum*) and *Gentista purgans*, as well as grassy meadows which are often very extensive.

The Alpine belt (from 2,200 to 2,900 m) is the domain of the grasslands, though these alternate with large screes and rocky areas. On the steeper slopes, rock and scree dominate completely. The vegetation of snow coombs, streams and fen complete a varied and often very broken landscape.

The highest peaks (over 2,900 m) can be

included in the sub-nival belt. The Alpine grassland is thinned out and reduced to small patches, and bare rocks and snowfields dominate the landscape.

I hope I have shown that, in the Catalan Pyrenees, the range in altitude, climate and vegetation is very marked. From the lowland that borders the range, to the central peaks, one moves, in a very short time, from the evergreen oak forests and Mediterranean crops to glacial vegetation, passing through various kinds of wood and grassland, rather as if we were to travel from the Mediterranean shores to the Arctic tundra. In a very small area, one finds a condensed sample of the main types of western European vegetation. Put another way, we could say that the existence of the Pyrenees is the chief factor that makes the Catalan flora one of the richest in Europe and that gives its landscape such a surprising diversity. ■