

MEDITERRANEAN AND SUBTROPICAL CLIMATIC ELEMENTS

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In order to characterize and ascribe a Mediterranean meteorological observatory that is not classified as dry, it would appear that the sequence of determiners from a lesser to greater extent and from a lower to higher level of understanding could be the following: temperate climate, dry summers, Mediterranean, and lastly, the variety corresponding to this type. However, this is not the usual means of identification, as, both out of habit and as a matter of convenience, the second of these references is usually disregarded, ignoring the fact that the concept of temperate climates with dry summers ranges far wider than just the Mediterranean climate. Consequently, these climates are not synonymous of each other.

This is undoubtedly not just a question of polysemy, but of flagrant inexactitude, inherently full of consequences, that extends to climatic classifications, in particular, those of a geographical nature. This then leads to errors when defining climates as Mediterranean, when really they are not, such as occurs particularly for the Iberian Peninsula.

It is in the geographical classifications of French origin and tradition that lie the greatest discrepancies when describing climates which are temperate with dry summers as Mediterranean and then subdividing them into categories based on totally unrelated factors. The geographical method was proposed by Emmanuel de Martonne in 1909 in his famous *Traité de géographie physique*; produced almost a century ago, and which is still the only geographical classification in existence, enriched and made more precise due to a regional study of specific areas by French geographers, in particular H. Baulig, J. Sion, P. George, J. Tricart y A. Cailleux, Ch. Péguy and P. Pagney.

From these texts it can be deduced that, in a broad sense, the concept of Mediterranean climates is used to describe those that in fact are not. The different climatic types mentioned in the literature share one common denominator, a lack of summer rain, which, rather than being an exclusively Mediterranean trait is also associated with subsidence and subtropical high pressure. On the other hand, without disregarding in any way the extraordinary wealth of climatological variations in the Mediterranean basin, such an immense reservoir of water and calories, well disposed as it is to cyclogenesis and rainfall, it would appear that a number of

features exist which separate the subset of truly Mediterranean climates from the great many temperate climates with dry summers. Thus, a certain climatic autonomy can be assigned to the Mediterranean Basin, within the framework of the general circulation of the west.

MEDITERRANEAN CLIMATES IN THE IBERIAN PENINSULA

The term «Mediterranean climate» has been traditionally defined as a type of generic climate which could be applied to virtually the whole of the Iberian Peninsula, with the exception of the northern limits, which are characterised primordially by a distinct drop in rainfall during summer months. This generic designation includes, for convenience and by force of habit, climates which are very different to those of a temperate nature with dry summers, which share this marked common denominator. An inappropriate synonymy between «Mediterranean climate» and «summer drought» has become fully accepted, with the lack of rainfall in this season attributable to higher latitudes and sub tropical high pressure. Consequently, this results in the inappropriate, albeit generalised, use of the term Mediterranean to refer to all Spanish climates with dry summers, even when considerably large areas of Spain are actually influenced by the Atlantic. It should be highlighted that, even when conditions are equal, the marine influence inland weakens sooner with a Mediterranean climate than an Atlantic climate, which is favoured by the presence of the predominantly eastern flow. Examples of this are the rivers Júcar and Segura, whose flows rise in an area affected by Atlantic influences; the late summer floods which are Mediterranean, and finally the dry summers and almost always, the droughts, which have a sub tropical connection.

The above mentioned tendency towards a simple climatic bipartition of the Iberian Peninsula is widely shared by Spanish climatologists as well as their foreign counterparts, see the following lines from Papadakis: «From a climatic point of view, Spain can be divided into two: Atlantic Spain which includes the Atlantic coast, the Cantabrian mountains and the Pyrenees; and Mediterranean Spain, which includes the rest of the country» (1980). Furthermore, he adds «The Spanish Meseta has a temperate Mediterranean climate ... The climate of the Mediterranean and the South Atlantic coast varies between maritime Mediterranean (6.2), subtropical Mediterranean (6.1) and subtropical semi-arid Mediterranean (6.8) ... The Canary Islands climate varies between semi-arid subtropical (3.3) in Punta Orchilla (Hiero) and tropical Mediterranean (6.4) in Tefia, Buena Ventura, Santa Cruz de Tenerife, Orotava/Tenerife, and Santa Cruz de La Palma».

Apart from oceanic climates, which do not feature dry summers, it is common to assign a Mediterranean connection to the rest of the Iberian Peninsula. However, the reality strongly contradicts this attribution as the greatest maritime effect felt within the peninsula is Atlantic, since it features a westerly airflow, which weakens as it moves eastwards. Here, but only in coastal and prelitoral zones, it finally gives way to a truly Mediterranean climate. In this respect, it should be reiterated that a good deal of the precipitation in the interior of the Iberian Peninsula has its origins in the Atlantic, limiting the Mediterranean coastal lands to sporadic but intense late summer or spring downpours, which rarely penetrate more than 200km inland. Only habit and convenience can explain the frequent and flagrant metonymy used when classifying temperate climates with dry summers as Mediterranean when in fact they have no Mediterranean influence or if they do, then it is greatly inferior to that of the Atlantic.

THE CLIMATIC TRANSCENDENCE OF THE MEDITERRANEAN

As has been indicated, classifying climates from outside the basin as Mediterranean implies not only a misnomer, but also shows a disregard for and underestimation of the atmospheric influence the great reservoir of water and its calories have on coastal areas.

The singularity of the denomination Mediterranean lies in the interaction of the atmosphere with a particular geographical feature, characterised by an immense body of warm evaporated water, which displays genuine thermoconvective behaviour. It should be highlighted that the Mediterranean basin, particularly in its western half, consists of a depression enclosed by a belt of high mountains and narrow meteorological passes, with repercussions for the regional atmospheric dynamic. This can be seen particularly in the inertia of air masses and the interplay of mechanisms such as the diverging fields in the high troposphere, the effect of discharge by hydrodynamic induction producing heavy downpours, and the principle of conservation at the moment of rotation of an absolute whirlwind, with specific demonstration of the hydrodynamic effect of the obstacle.

With regard to thermic interchanges between the atmosphere and the sea, the Mediterranean provides a heat source for the air with which it comes into contact during autumn and winter, strongly contributing to atmospheric instability from September to November. By contrast, as a result of the stability of the water in summer, the cooling effect during this time of year is minimal, with high monthly averages. This translates into an annual thermal amplitude for Mediterranean observatories which is almost double the rate registered in an oceanic climate.

Geographical coordinates, relief, direction of particular winds and the orientation of the coastline, among other features, serve to fragment this domain into a veritable climatic mosaic, particularly in terms of annual quantity, irregularity, and distribution of precipitation.

A common denominator of Mediterranean rainfall regimes is a lack of summer precipitation. As regards this essential feature, it is necessary however, as has been stated previously, to offer a series of clarifications. To a greater or lesser extent, in almost all the observatories, except for some mountain observatories, where storms frequently occur, the summer minimum is very marked. Therefore, it can be categorically stated that Mediterranean basin climates are synonymous with dry summers, which does not mean that climates with dry summers are Mediterranean; an assertion that is clearly erroneous but, for reasons given, is thoroughly accepted in accredited climatological works. For this reason, it is necessary to stress that dry summers do not result from a Mediterranean influence, but from the proximity to subtropical subsidence which, due to its increasing latitude in this season, acts as the main factor in impeding or restricting precipitation.

Apparently contradictory assertions about Mediterranean rainfall are made which are not always restricted to their corresponding areas. Such an error occurs when diversity is simplified or simply ignored. For example, Cabo de Gata, with an average annual rainfall of 125 – 150 mm and with years of hardly any rain, is the dry spot of Europe. Meanwhile, the Saharan climate is evident in the Mediterranean basin in places such as Libya and Egypt. However, this must be contrasted with the Gulf of Genoa, with its numerous storms of variable origin, and with the Boka Kotorska in Montenegro, from which rise the Orjen and Lorcen mountains, home to the observatory which registers the highest rainfall in Europe with an average of almost 5 metres, and which received a total of 8 metres in 1937. The

orographic accentuation of total rainfall is vital information as regards Mediterranean climatology, as can be seen by the fact that observatories register 2 metres in the western Rif, whilst it is quite normal for 1 metre of rainfall to be registered in the Mid-Atlas Mountains.

In short, the Mediterranean basin includes many singular traits, peculiarities and specifics. Consequently, it would be unwise to extrapolate and use the term Mediterranean as an adjective for any climatic type found to exist away from the confines of the basin itself; climates which are so distant and diverse from the Mediterranean climate and perfectly differentiated and established in their respective geographic environments.

SOME CONCLUSIONS

Describing temperate climates with dry summers as Mediterranean is highly erroneous and misleading, given that the expressions are not equivalent and neither can they be considered synonymous; the former being the whole and the latter only part of this. As a consequence, it would seem appropriate to restrict the term Mediterranean to the climates within the Mediterranean basin, and not to other temperate zones characterised by dry summers outside of the basin, be they in Europe, Africa, America or Australia.

As has been reiterated, the point of connection or the common denominator, temperate climates with dry summers, is precisely this combination of characteristics, which is not related to 'Mediterranean-ness', but rather to 'subtropicality'. In other words, it is associated to the fact that, in summer, western territories situated within a certain latitudinal range fall under the effects of subsidence and subtropical high pressure, due to the cosmic mechanism of the seasons caused by the increase in latitude of atmospheric mechanisms.

The aforementioned use of the term Mediterranean climate also occurs habitually in the climatic descriptions of the Iberian Peninsula, since the term Mediterranean is used to describe its temperate climate with dry summers. However, as regards peninsula climates that are temperate with dry summers, those with Mediterranean traits actually occupy the least surface area, as the Peninsula is affected to a greater extent, in terms of land mass, by those with an Atlantic influence, or those that feel the strong effects of continentalization. In effect, those climates described as being temperate with dry summers with Mediterranean connections are restricted to coastal or, at most, pre-coastal zones. This is due to the fact that this area of the Mediterranean is shielded by mountains, where the Mediterranean climatic influence is exerted against the prevailing westerly flow and thus its capacity to penetrate inland is quite modest, apart from certain hydrometeors in favour of sporadic Levante (easterly), Gregal (north-easterly), and Sirocco (southerly) winds.

In short, not only in the context of the Iberian Peninsula but also in global terms, it would seem logical to refer to temperate climates with dry summers or even temperate climates with subtropical dry summers as the generic term, whilst saving the term Mediterranean exclusively to describe those climates that belong to the Mediterranean basin and also possess its identifiable traits, given that this term is of great interest and importance in its own right as regards climate characterization.