

# Phytosociological Research Center

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## Worldwide Bioclimatic Classification System

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(Adapted to Synoptical Table 14/02/2020)

ZARAGOZA (ESP ZARAGOZA)

Altitude: 250 m.

Latitude: 41°38'N Longitude: 0°53'W

Temperature observation period.: 1931-1970 (40)

Rainfall observation period....: 1931-1970 (40)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	EPI
Jan.	6.10	9.80	2.30	16.80	-3.60	16.0	11.54
Feb.	7.60	12.20	3.10	17.90	-2.90	16.0	16.18
Mar.	11.30	16.50	6.00	23.10	1.00	30.0	37.42
Apr.	13.70	19.30	8.20	26.00	3.60	31.0	54.72
May.	17.00	22.70	11.30	30.60	5.90	48.0	85.81
Jun.	21.20	27.30	15.10	35.20	10.50	37.0	121.47
Jul.	23.90	30.50	17.30	36.60	13.00	18.0	147.22
Aug.	23.70	30.10	17.40	36.70	13.30	19.0	135.11
Sep.	20.60	26.20	15.00	33.00	9.70	31.0	95.17
Oct.	15.40	20.30	10.50	26.50	4.50	34.0	55.57
Nov.	10.20	14.30	6.10	20.20	0.00	28.0	25.45
Dec.	6.70	9.90	3.60	16.00	-2.30	32.0	12.84
Year	14.78	19.93	9.66	26.55	4.39	340	798.51

### BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	269
Compensated thermicity index.....(Itc):	269
Simple continentality index.....(Ic):	17.8
Diurnality index.....(Id):	13.2
Annual ombrothermic index.....(Io):	1.92
Monthly estival ombrothermic index.....(Ios1):	0.75
Bimonthly estival ombrothermic index.....(Ios2):	0.78
Threemonthly estival ombrothermic index.....(Ios3):	1.08
Fourmonthly estival ombrothermic index.....(Ios4):	1.42
Annual ombro-evaporation index.....(Ioe):	0.43
Annual positive temperature.....(Tp):	1774
Annual negative temperature.....(Tn):	0
Estival temperature.....(Ts):	688
Positive precipitation.....(Pp):	340

N. of Months	P>4T	P:2T-4T	PT-2T	P<T	T<0
	1	7	2	2	0

Latitudinal Belt...: Low Eutemperate

Continentality.....: Oceanic - Low Semicontinental

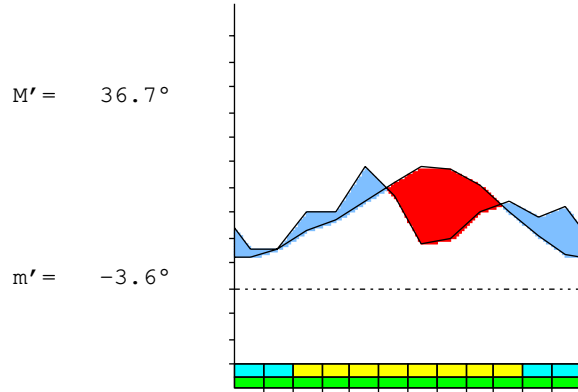
Bioclimate(Variant): MEDITERRANEAN XERIC-OCEANIC (STEPIC)

Bioclimatic Belt...: UPPER MESOMEDITERRANEAN UPPER SEMIARID

ZARAGOZA (ESP ZARAGOZA)

250 m

P= 340      41° 38'N      0° 53'W      40/40 y.  
 T= 14.8 °    Ic= 17.8      Tp= 1774      Tn= 0  
 m= 2.3 °      M= 9.8 °      Itc= 269      Io= 1.9



MEDITERRANEAN XERIC-OCEANIC (STEPPIC)  
 UPPER MESOMEDITERRANEAN UPPER SEMIARID

WATER INDEX CARD

ZARAGOZA (ESP ZARAGOZA)

Altitude: 250 m.

Latitude: 41° 38'N

(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jan.	6.1	12	16	4	26	12	0	0	0	0.3
Feb.	7.6	16	16	-0	26	16	0	0	0	0.0
Mar.	11.3	37	30	-7	19	37	0	0	0	-0.1
Apr.	13.7	55	31	-19	0	50	5	0	0	-0.4
May.	17.0	86	48	0	0	48	38	0	0	-0.4
Jun.	21.2	121	37	0	0	37	84	0	0	-0.6
Jul.	23.9	147	18	0	0	18	129	0	0	-0.8
Aug.	23.7	135	19	0	0	19	116	0	0	-0.8
Sep.	20.6	95	31	0	0	31	64	0	0	-0.6
Oct.	15.4	56	34	0	0	34	22	0	0	-0.3
Nov.	10.2	25	28	3	3	25	0	0	0	0.1
Dec.	6.7	13	32	19	22	13	0	0	0	1.4
Year	14.8	799	340	*	*	340	459	0	0	*

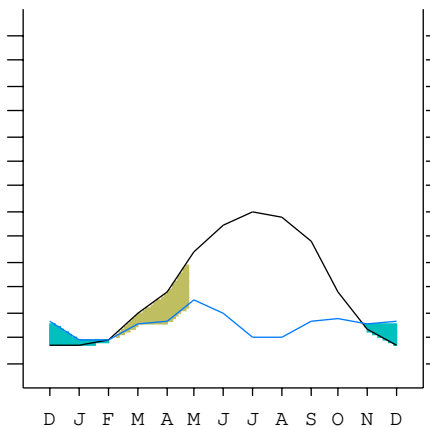
R = Reserve    VR = Variation of the reserve    RE = Real evapotranspiration  
 DR = Drainage    HC = Humidity coefficient    DF = Deficit    SP = Superavit

ZARAGOZA (ESP ZARAGOZA)

41°38'N    0°53'W    250 m 40/40 y.

T= 14.8    Ic= 17.8    MEDITERRANEAN XERIC-OCEANIC (STEPPIC)  
 m= 2.3    Tp= 1774    UPPER MESOMEDITERRANEAN  
 M= 9.8    Tn= 0    UPPER SEMIARID  
 M' = 36.7    Itc= 269  
 m' = -3.6    Io= 1.9  
 P= 340    mm ———  
 PE= 799    mm ———

Imbibing	27 Oct.
Saturation	29 Jan.
Reserve Use	24 Apr.
Deficit	



ZARAGOZA (ESP ZARAGOZA)

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SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continentality Index [B1a]  
 + Type .....: B. Oceanic  
 + Subtype .....: 1. Semicontinental  
 + Variant .....: a. Low  
 Thermic types [B1.B4]  
 + Latitudinal zone ....: B. Temperate  
 + Latitudinal belt ....: 1. Low Eutemperate  
 + Thermic type .....: B. Temperate  
 + Thermic subtype .....: 4. Temperate  
 Bioclimatic types [B6a.3a.4a]  
 + Macrobioclimate .....: B. MEDITERRANEAN  
 + Bioclimate .....: 6. XERIC-OCEANIC  
 + Bioclimatic variant .: STEPPIC  
 + Thermic type.....: 3. MESOMEDITERRANEAN  
 + Thermic subtype.....: a. UPPER  
 + Ombrothermic type ...: 4. SEMIARID  
 + Ombrothermic subtype : a. UPPER  
 Bioclimatic Classification .....Mexo(Stp).Mme.Sar.Sec

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PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 187  
 Coldest semester of the year.....(Psw): 153  
 Warmest four months period of the year.....(Pcm1): 105  
 Following warmest four months period.....(Pcm2): 110  
 Positive precipitation dryest 3 months.....(Ppd): 62  
 Positive precipitation dryest 2 months.....(Ppd2): 32  
 Positive precipitation dryest 1 month.....(Ppd1): 16  
 Positive precipitation warmest 3 months.....(Pps): 74  
 Positive precipitation warmest 2 months.....(Pps2): 37  
 Positive precipitation warmest 1 month.....(Pps1): 18  
 Positive precipitation coldest 3 months.....(Ppw): 64  
 Positive precipitation coldest 2 months.....(Ppw2): 48  
 Positive precipitation coldest 1 month.....(Ppw1): 16

Seasons	Winter Tr1-W	Spring Tr2-P	Summer Tr3-S	Automn Tr4-F
Rainfall	64	109	74	93

Seasonal rainfall rhythms: P > F > S > W

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TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 23.9  
 Average coldest month [T].....(Tmin): 6.1  
 Maximum temp. warmest month [M].....(Tmmax): 30.5  
 Minimum temp. coldest month [m].....(Tmmin): 2.3  
 Absolute Max.temp. warmest month [M'].....(Tamax): 36.7  
 Absolute Min.temp. coldest month [m'].....(Tamin): -3.6  
 First warmest contrasted month [M].....(Tcmax): 30.5 (7)  
 First coldest contrasted month [m].....(Tcmin): 17.3 (7)  
 Estival temperature.....(Ts): 688  
 Positive temperature dryest 3 months.....(Tpd): 250  
 Positive temperature dryest 2 months.....(Tpd2): 137  
 Positive temperature dryest 1 month.....(Tpd1): 61  
 Positive temperature warmest 3 months.....(Tps): 688  
 Positive temperature warmest 2 months.....(Tps2): 476  
 Positive temperature warmest 1 month.....(Tps1): 239  
 Positive temperature coldest 3 months.....(Tpw): 204  
 Positive temperature coldest 2 months.....(Tpw2): 128  
 Positive temperature coldest 1 month.....(Tpw1): 61

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SEASONAL PARAMETERS

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Warmest semester...(Sms)					o	o	o	o	o	o		
Dryest semester....(Smd)	o	o	o	o							o	o
Warmest 4 months...(Cm1)						o	o	o	o			
Dryest 4 months....(Cmd)	o	o									o	o
Vegetation Activity(Pav)	o	o	o	o	o	o	o	o	o	o	o	o
Ultragelid...[M'<=0] (Pf)												
Hypergelid...[M <=0] (Pf)												
Gelid.....[T <=0] (Pf)												
Subgelid.....[m <=0] (Pf)												
Pregelid.....[m'<=0] (Pf)	o	o									o	o
Agelid.....[m'> 0] (Pf)			o	o	o	o	o	o	o	o		
HiperAgelid..[all>0] (Pf)			o	o	o	o	o	o	o	o		

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OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 2.35  
 Mediterranean index of July.[PE/P].....(Im1): 8.18  
 Mediterranean index of July & August.....(Im2): 7.63  
 Mediterranean index of June, July & August....(Im3): 5.46

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp(x10)	320	160	160	300	310	480	370	180	190	310	340	280
Tp	67	61	76	113	137	170	212	239	237	206	154	102
Io (Iom)	4.78	2.62	2.11	2.65	2.26	2.82	1.75	0.75	0.80	1.50	2.21	2.75
Seasons	Winter			Spring			Summer			Autumn		
Pp(x10)/Tp	640 / 204			1090 / 420			740 / 688			930 / 462		
Io (Iot)	3.137			2.595			1.076			2.013		
Semesters	December-May						June-November					
Pp(x10)/Tp	1730 / 624						1670 / 1150					
Io (Iosm)	2.772						1.452					

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Aridity Value Index (AVI)

[10xPP/TP=IO]: 3400/1774=1.92 **There is No Yearly Aridity**

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	320	160	160	300	310	480	370	180	190	310	340	280
TP [T*10]	67	61	76	113	137	170	212	239	237	206	154	102
Iom [Pp/TP]	478	262	211	265	226	282	175	75	80	150	221	275
Avm [200-Iom]	***	***	***	***	***	***	25	125	120	50	***	***
Seasons	Winter			Spring			Summer			Autumn		
Pp / Tp	640 / 204			1090 / 420			740 / 688			930 / 462		
Iot [Pp/TP]	314			260			108			201		
Avs E[Avm<200]	***			***			270			***		
Strong upper arid [1]							Weak upper arid [1]					
Strong lower semiarid [1]							Strong upper semiarid [1]					
Weak upper semiarid [1]												

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BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin] .....	(Sp): 17.80
CI of Gorezinski (1920) [1.7*Sp/sin(Lat)-20.4] .....	25.15
CI of Conrad (1946) [1.7*Sp/sin(Lat+10)-14] .....	24.59
+ Oceanic (20<CI<40)	
CI of Currey (1974) [CI=Sp/(1+Lat/3)] .....	1.20
+ Subcontinental (1.1<CI<1.7)	
Rainfall Index of Lang (1925) [R=P/T] .....	23.00
+ Steppic (40>R>0)	
Aridity Index of Martonne (1926) [Ia=P/(T+10)] .....	13.72
+ Arid -steppic- (15>Ia>5)	
I of Emberger (1930) [Q=100*P/(Tmax <sup>2</sup> -Tmin <sup>2</sup> )] .....	36.76
+ Semiarid (50>Q>30)	
I of Dantin & Revenga (1940) [DR=100*T/P] .....	4.35
+ Arid (6>DR>3)	
Aridity Index of UNEP [I=P/PE] .....	0.43
+ Semiarid (0.5>Im>0.2)	
Potential Erosion I of Fournier (1960) [K=Pi <sup>2</sup> /P].....	6.78
+ Very low (K<60)	

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BIOCLIMATIC INDICES II

Bioclimatic classification of Gaussen & Bagnouls (1957)  
 + Climate ..... A. Warm and temperate warm  
 + Region ..... 3. Termoxeroteric (Mediterranean warm)  
 + Thermic type: 4. Mesothermic

Thornthwaite (1948)												
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.08	0.08	0.14	0.13	0.20	0.13	0.06	0.06	0.11	0.14	0.13	0.18
T-E ratio	2.74	3.42	5.09	6.16	7.65	9.54	10.75	10.67	9.27	6.93	4.59	3.01
Precipitation-effectiveness: 14.53						Temperature-efficiency .....: 79.83						
Moisture Index [MI=100*(P-PE)/PE] .....												
+ D.Semiarid (-66.7<MI<-33.3)												
Index of dryness [DI=100*d/PE] .....												
+ Strong deficit (33.3<DI)												
Index of humidity [HI=100*s/PE] .....												
+ No surplus (0<HI<10)												
Potential Evapotranspiration PE .....												
+ Second mesothermic (712<PE<855)												

