

# Phytosociological Research Center

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## Worldwide Bioclimatic Classification System

S.Rivas-Martinez(+) & S.Rivas-Saenz

(Adapted to Synoptical Table 14/02/2020)

MARCHENA (ESP SEVILLA) Altitude: 120 m.

Latitude: 37°19'N Longitude: 5°25'W

Temperature observation period.: 1969-1990 (22)

Rainfall observation period....: 1968-1990 (23)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	EPI
Jan.	10.00	15.20	4.80	19.70	0.00	87.8	19.16
Feb.	11.20	16.70	5.70	21.80	1.50	66.4	23.35
Mar.	12.70	18.80	6.60	24.80	2.20	53.9	35.68
Apr.	15.10	21.30	8.90	28.60	5.10	53.8	52.44
May.	17.80	24.40	11.20	31.30	6.70	33.7	78.79
Jun.	22.70	30.10	15.30	37.90	10.10	18.5	124.43
Jul.	26.40	34.70	18.00	41.00	12.00	5.9	167.09
Aug.	26.60	34.70	18.40	40.80	13.00	5.7	159.47
Sep.	24.00	31.40	16.60	37.00	10.60	21.9	115.47
Oct.	18.50	24.90	12.00	32.20	6.40	55.7	67.27
Nov.	14.70	20.50	8.80	26.60	3.60	78.9	38.56
Dec.	10.50	15.90	5.20	21.60	0.10	88.9	20.24
Year	17.52	24.05	10.96	30.28	5.94	571	901.95

### BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	375
Compensated thermicity index.....(Itc):	375
Simple continentality index.....(Ic):	16.6
Diurnality index.....(Id):	16.7
Annual ombrothermic index.....(Io):	2.72
Monthly estival ombrothermic index.....(Ios1):	0.21
Bimonthly estival ombrothermic index.....(Ios2):	0.22
Threemonthly estival ombrothermic index.....(Ios3):	0.40
Fourmonthly estival ombrothermic index.....(Ios4):	0.68
Annual ombro-evaporation index.....(Ioe):	0.63
Annual positive temperature.....(Tp):	2102
Annual negative temperature.....(Tn):	0
Estival temperature.....(Ts):	757
Positive precipitation.....(Pp):	571

N. of Months	P>4T	P:2T-4T	PT-2T	P<T	T<0
	5	2	1	4	0

Latitudinal Belt....: Low Eutemperate

Continentality.....: Oceanic - Low Euoceanic

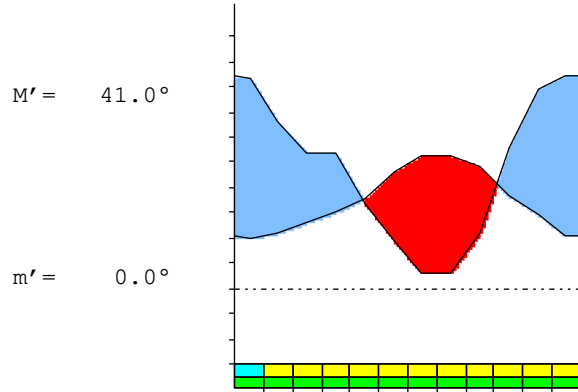
Bioclimate.....: MEDITERRANEAN PLUVISEASONAL-OCEANIC

Bioclimatic Belt....: UPPER THERMOMEDITERRANEAN LOW DRY

MARCHENA (ESP SEVILLA)

120 m

P= 571 37° 19'N 5° 25'W 22/23 y.  
 T= 17.5 ° Ic= 16.6 Tp= 2102 Tn= 0  
 m= 4.8 ° M= 15.2 ° Itc= 375 Io= 2.7



MEDITERRANEAN PLUVISEASONAL-OCEANIC  
 UPPER THERMOMEDITERRANEAN LOW DRY

WATER INDEX CARD MARCHENA (ESP SEVILLA)  
 Altitude: 120 m. Latitude: 37° 19'N

(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jan.	10.0	19	88	0	100	19	0	69	37	3.5
Feb.	11.2	23	66	0	100	23	0	43	40	1.8
Mar.	12.7	36	54	0	100	36	0	18	29	0.5
Apr.	15.1	52	54	0	100	52	0	1	15	0.0
May.	17.8	79	34	-45	55	79	0	0	8	-0.5
Jun.	22.7	124	19	-55	0	73	51	0	4	-0.8
Jul.	26.4	167	6	0	0	6	161	0	2	-0.9
Aug.	26.6	159	6	0	0	6	154	0	1	-0.9
Sep.	24.0	115	22	0	0	22	94	0	0	-0.8
Oct.	18.5	67	56	0	0	56	12	0	0	-0.1
Nov.	14.7	39	79	40	40	39	0	0	0	1.0
Dec.	10.5	20	89	60	100	20	0	9	5	3.3
Year	17.5	902	571	*	*	431	471	140	140	*

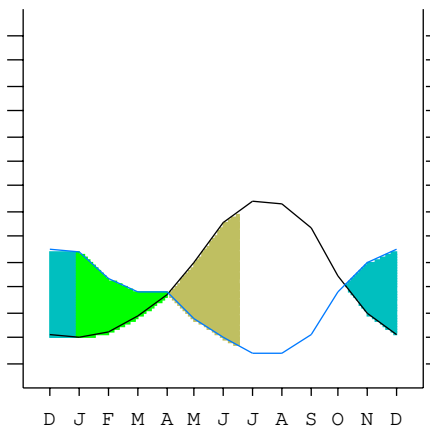
R = Reserve VR = Variation of the reserve RE = Real evapotranspiration  
 DR = Drainage HC = Humidity coefficient DF = Deficit SP = Superavit

MARCHENA (ESP SEVILLA)

37°19'N 5°25'W 120 m 22/23 y.

T= 17.5 Ic= 16.6 MEDITERRANEAN PLUVISEASONAL-OCEANIC  
 m= 4.8 Tp= 2102 UPPER THERMOMEDITERRANEAN  
 M= 15.2 Tn= 0 LOW DRY  
 M' = 41.0 Itc= 375  
 m' = 0.0 Io= 2.7  
 P= 571 mm  
 PE= 902 mm

Imbibing	7 Oct.
Saturation	27 Dec.
Reserve Use	1 Apr.
Deficit	16 Jun.



MARCHENA (ESP SEVILLA)

Latitude: 37°19'N Longitude: 5°25'W Altitude: 120 m

SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continentality Index [B2b]  
 + Type .....: B. Oceanic  
 + Subtype .....: 2. Euoceanic  
 + Variant .....: b. Low

Thermic types [B1.A3]  
 + Latitudinal zone ....: B. Temperate  
 + Latitudinal belt ....: 1. Low Eutemperate  
 + Thermic type .....: A. Warm  
 + Thermic subtype .....: 3. Subwarm

Bioclimatic types [B8.2a.5b]  
 + Macrobioclimate .....: B. MEDITERRANEAN  
 + Bioclimate .....: 8. PLUVISEASONAL-OCEANIC  
 + Bioclimatic variant .:  
 + Thermic type.....: 2. THERMOMEDITERRANEAN  
 + Thermic subtype.....: a. UPPER  
 + Ombrothermic type ...: 5. DRY  
 + Ombrothermic subtype : b. LOW

Bioclimatic Classification .....Mepo.Tme.Dry.Euo

MARCHENA (ESP SEVILLA)

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PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 141  
 Coldest semester of the year.....(Psw): 430  
 Warmest four months period of the year.....(Pcm1): 52  
 Following warmest four months period.....(Pcm2): 311  
 Positive precipitation dryest 3 months.....(Ppd): 30  
 Positive precipitation dryest 2 months.....(Ppd2): 12  
 Positive precipitation dryest 1 month.....(Ppd1): 6  
 Positive precipitation warmest 3 months.....(Pps): 34  
 Positive precipitation warmest 2 months.....(Pps2): 12  
 Positive precipitation warmest 1 month.....(Pps1): 6  
 Positive precipitation coldest 3 months.....(Ppw): 243  
 Positive precipitation coldest 2 months.....(Ppw2): 177  
 Positive precipitation coldest 1 month.....(Ppw1): 88

Seasons	Winter Tr1-W	Spring Tr2-P	Summer Tr3-S	Automn Tr4-F
Rainfall	243	141	30	156

Seasonal rainfall rhythms: W > F > P > S

MARCHENA (ESP SEVILLA)

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TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 26.6  
 Average coldest month [T].....(Tmin): 10.0  
 Maximum temp. warmest month [M].....(Tmax): 34.7  
 Minimum temp. coldest month [m].....(Tmin): 4.8  
 Absolute Max.temp. warmest month [M'].....(Tamax): 41.0  
 Absolute Min.temp. coldest month [m'].....(Tamin): 0.0  
 First warmest contrasted month [M].....(Tcmax): 34.7 (7)  
 First coldest contrasted month [m].....(Tcmin): 18.0 (7)  
 Estival temperature.....(Ts): 757  
 Positive temperature dryest 3 months.....(Tpd): 757  
 Positive temperature dryest 2 months.....(Tpd2): 530  
 Positive temperature dryest 1 month.....(Tpd1): 266  
 Positive temperature warmest 3 months.....(Tps): 770  
 Positive temperature warmest 2 months.....(Tps2): 530  
 Positive temperature warmest 1 month.....(Tps1): 266  
 Positive temperature coldest 3 months.....(Tpw): 317  
 Positive temperature coldest 2 months.....(Tpw2): 205  
 Positive temperature coldest 1 month.....(Tpw1): 100

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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											
Agelid.....[m'> 0] (Pf)		o	o	o	o	o	o	o	o	o	o	o
HiperAgelid..[all>0] (Pf)		o	o	o	o	o	o	o	o	o	o	o

MARCHENA (ESP SEVILLA)

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OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 1.58  
 Mediterranean index of July.[PE/P].....(Im1): 28.32  
 Mediterranean index of July & August.....(Im2): 28.15  
 Mediterranean index of June, July & August....(Im3): 14.98

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp(x10)	889	878	664	539	538	337	185	59	57	219	557	789
Tp	105	100	112	127	151	178	227	264	266	240	185	147
Io (Iom)	8.47	8.78	5.93	4.24	3.56	1.89	0.81	0.22	0.21	0.91	3.01	5.37
Seasons	Winter			Spring			Summer			Autumn		
Pp(x10)/Tp	2431 / 317			1414 / 456			301 / 757			1565 / 572		
Io (Iot)	7.669			3.101			0.398			2.736		
Semesters	December-May						June-November					
Pp(x10)/Tp	3845 / 773						1866 / 1329					
Io (Iosm)	4.974						1.404					

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Aridity Value Index (AVI)

[10xPP/TP=IO]: 5711/2102=2.72 There is No Yearly Aridity

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	889	878	664	539	538	337	185	59	57	219	557	789
TP [T*10]	105	100	112	127	151	178	227	264	266	240	185	147
Iom [Pp/TP]	847	878	593	424	356	189	81	22	21	91	301	537
Avm [200-Iom]	***	***	***	***	***	11	119	178	179	109	***	***
Seasons	Winter			Spring			Summer			Autumn		
Pp / Tp	2431 / 317			1414 / 456			301 / 757			1565 / 572		
Iot [Pp/TP]	767			310			40			274		
Avs E[Avm<200]	***			***			475			***		
Lower hyperarid [2]							Strong lower arid [1]					
Weak upper arid [2]							Weak upper semiarid [1]					

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BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin] .....	(Sp): 16.60
CI of Gorezinski (1920) [1.7*Sp/sin(Lat)-20.4] .....	26.15
CI of Conrad (1946) [1.7*Sp/sin(Lat+10)-14] .....	24.39
+ Oceanic (20<CI<40)	
CI of Currey (1974) [CI=Sp/(1+Lat/3)] .....	1.24
+ Subcontinental (1.1<CI<1.7)	
Rainfall Index of Lang (1925) [R=P/T] .....	32.60
+ Steppic (40>R>0)	
Aridity Index of Martonne (1926) [Ia=P/(T+10)] .....	20.75
+ Subhumid (30>Ia>20)	
I of Emberger (1930) [Q=100*P/(Tmmax <sup>2</sup> -Tmmin <sup>2</sup> )] .....	48.36
+ Semiarid (50>Q>30)	
I of Dantin & Revenga (1940) [DR=100*T/P] .....	3.07
+ Arid (6>DR>3)	
Aridity Index of UNEP [I=P/PE] .....	0.63
+ Subhumid - dry (0.65>I>0.5)	
Potential Erosion I of Fournier (1960) [K=Pi <sup>2</sup> /P].....	13.84
+ 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: 3. Macro-mesothermic

Thornthwaite (1948)												
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.48	0.34	0.26	0.24	0.13	0.06	0.02	0.01	0.07	0.23	0.37	0.48
T-E ratio	4.50	5.04	5.71	6.80	8.01	10.22	11.88	11.97	10.80	8.32	6.61	4.72
Precipitation-effectiveness: 26.88						Temperature-efficiency .....: 94.59						
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] .....												
+ Moderate surplus (10<HI<20)												
Potential Evapotranspiration PE .....												
+ Third mesothermic (855<PE<997)												

