

Phytosociological Research Center

www.globalbioclimatics.org

Worldwide Bioclimatic Classification System

Prof.Dr. Salvador Rivas-Martinez

(Adapted to Synoptical Table 30/08/2017)

MALAGA (ESP MALAGA)

Altitude: 16 m.

Latitude: 36°39'N Longitude: 4°29'W

Temperature observation period.: 1971-1994 (24)

Rainfall observation period....: 1964-1994 (31)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	Epi
Jan.	12.22	16.11	8.33	22.78	0.00	48.0	25.78
Feb.	12.78	16.67	8.89	25.56	1.67	53.1	27.79
Mar.	14.17	17.78	10.56	27.22	3.33	75.9	41.15
Apr.	16.67	20.56	12.78	31.67	6.11	38.1	60.24
May.	19.45	23.33	15.56	32.78	7.78	20.1	90.13
Jun.	22.78	26.67	18.89	37.78	11.11	9.9	123.49
Jul.	25.00	28.89	21.11	40.56	12.78	1.0	150.33
Aug.	25.83	29.44	22.22	40.56	16.67	0.0	149.92
Sep.	23.61	27.22	20.00	36.11	11.11	30.0	110.85
Oct.	19.72	23.33	16.11	30.56	4.44	72.9	73.61
Nov.	15.56	19.44	11.67	28.33	4.44	96.0	40.72
Dec.	12.78	16.67	8.89	23.89	1.67	64.0	27.14
Year	18.38	22.18	14.58	31.48	6.76	509	921.16

BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	428
Compensated thermicity index.....(Itc):	428
Simple continentality index.....(Ic):	13.6
Diurnality index.....(Id):	7.8
Annual ombrothermic index.....(Io):	2.31
Monthly estival ombrothermic index.....(Ios1):	No
Bimonthly estival ombrothermic index.....(Ios2):	0.02
Threemonthly estival ombrothermic index.....(Ios3):	0.15
Fourmonthly estival ombrothermic index.....(Ios4):	0.33
Annual ombro-evaporation index.....(Ioe):	0.36
Annual positive temperature.....(Tp):	2206
Annual negative temperature.....(Tn):	0
Estival temperature.....(Ts):	736
Positive precipitation.....(Pp):	509

N. of	P>4T	P:2T-4T	PT-2T	P<T	T<0
Months	4	3	2	3	0

Latitudinal Belt...: Low eutemperate

Continentalty.....: Oceanic - Low Semihyperoceanic

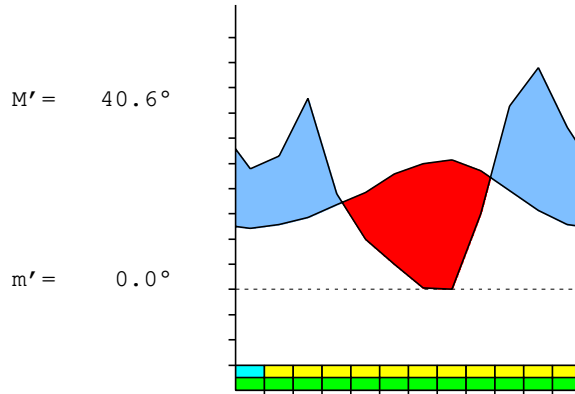
Bioclimate.....: MEDITERRANEAN PLUVISEASONAL-OCEANIC

Bioclimatic Belt...: LOW THERMOMEDITERRANEAN LOW DRY

MALAGA (ESP MALAGA)

16 m

P= 509 36° 39'N 4° 29'W 24/31 y.
 T= 18.4° Ic= 13.6 Tp= 2206 Tn= 0
 m= 8.3° M= 16.1° Itc= 428 Io= 2.3



MEDITERRANEAN PLUVISEASONAL-OCEANIC
 LOW THERMOMEDITERRANEAN LOW DRY

WATER INDEX CARD

MALAGA (ESP MALAGA)

Altitude: 16 m.

Latitude: 36° 39'N

(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jan.	12.2	26	48	8	100	26	0	14	7	0.8
Feb.	12.8	28	53	0	100	28	0	25	16	0.9
Mar.	14.2	41	76	0	100	41	0	35	26	0.8
Apr.	16.7	60	38	-22	78	60	0	0	13	-0.3
May.	19.5	90	20	-70	8	90	0	0	6	-0.7
Jun.	22.8	123	10	-8	0	18	106	0	3	-0.9
Jul.	25.0	150	1	0	0	1	149	0	2	-0.9
Aug.	25.8	150	0	0	0	0	150	0	1	-1.0
Sep.	23.6	111	30	0	0	30	81	0	0	-0.7
Oct.	19.7	74	73	0	0	73	1	0	0	0.0
Nov.	15.6	41	96	55	55	41	0	0	0	1.3
Dec.	12.8	27	64	37	92	27	0	0	0	1.3
Year	18.4	921	509	*	*	435	487	74	74	*

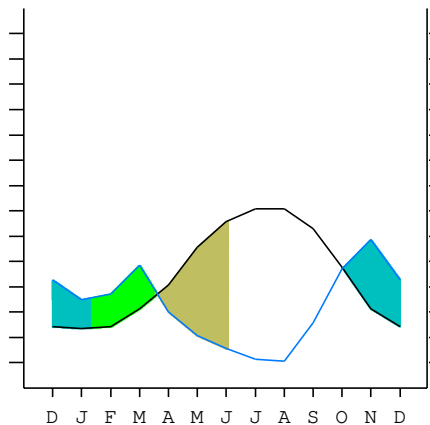
R = Reserve VR = Variation of the reserve RE = Real evapotranspiration
 DR = Drainage HC = Humidity coefficient DF = Deficit SP = Superavit

MALAGA (ESP MALAGA)

36°39'N 4°29'W 16 m 24/31 y.

T= 18.4 Ic= 13.6 MEDITERRANEAN PLUVISEASONAL-OCEANIC
 m= 8.3 Tp= 2206 LOW THERMOMEDITERRANEAN
 M= 16.1 Tn= 0 LOW DRY
 M' = 40.6 Itc= 428
 m' = 0.0 Io= 2.3
 P= 509 mm ———
 PE= 921 mm ———

Imbibing	1 Oct.
Saturation	11 Jan.
Reserve Use	19 Mar.
Deficit	3 Jun.



MALAGA (ESP MALAGA)

Latitude: 36°39'N Longitude: 4°29'W Altitude: 16 m

SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continental Index [B1b]
 + Type: B. Oceanic
 + Subtype: 1. Semihyperoceanic
 + 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 [B8.2b.5b]
 + Macrobioclimate: B. MEDITERRANEAN
 + Bioclimate: 8. PLUVISEASONAL-OCEANIC
 + Bioclimatic variant ..:
 + Thermic type.....: 2. THERMOMEDITERRANEAN
 + Thermic subtype.....: b. LOW
 + Ombrothermic type ...: 5. DRY
 + Ombrothermic subtype : b. LOW

Bioclimatic Classification: Mehc.Tme.Dry

MALAGA (ESP MALAGA)

Latitude: 36°39'N Longitude: 4°29'W Altitude: 16 m

PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 134
 Coldest semester of the year.....(Psw): 375
 Warmest four months period of the year.....(Pcm1): 41
 Following warmest four months period.....(Pcm2): 281
 Positive precipitation dryest 3 months.....(Ppd): 11
 Positive precipitation dryest 2 months.....(Ppd2): 1
 Positive precipitation dryest 1 month.....(Ppd1): 0
 Positive precipitation warmest 3 months.....(Pps): 31
 Positive precipitation warmest 2 months.....(Pps2): 1
 Positive precipitation warmest 1 month.....(Pps1): 0
 Positive precipitation coldest 3 months.....(Ppw): 165
 Positive precipitation coldest 2 months.....(Ppw2): 101
 Positive precipitation coldest 1 month.....(Ppw1): 48

Seasons	Winter Tr1-W	Spring Tr2-P	Summer Tr3-S	Automn Tr4-F
Rainfall	165	134	10	198

Seasonal rainfall rhythms: F > W > P > S

MALAGA (ESP MALAGA)

Latitude: 36°39'N Longitude: 4°29'W Altitude: 16 m

TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 25.8
 Average coldest month [T].....(Tmin): 12.2
 Maximum temp. warmest month [M].....(Tmmax): 29.4
 Minimum temp. coldest month [m].....(Tmmin): 8.3
 Absolute Max.temp. warmest month [M'].....(Tamax): 40.6
 Absolute Min.temp. coldest month [m'].....(Tamin): 0.0
 First warmest contrasted month [M].....(Tcmax): 16.1 (1)
 First coldest contrasted month [m].....(Tcmin): 8.3 (1)
 Estival temperature.....(Ts): 736
 Positive temperature dryest 3 months.....(Tpd): 736
 Positive temperature dryest 2 months.....(Tpd2): 508
 Positive temperature dryest 1 month.....(Tpd1): 258
 Positive temperature warmest 3 months.....(Tps): 744
 Positive temperature warmest 2 months.....(Tps2): 508
 Positive temperature warmest 1 month.....(Tps1): 258
 Positive temperature coldest 3 months.....(Tpw): 378
 Positive temperature coldest 2 months.....(Tpw2): 250
 Positive temperature coldest 1 month.....(Tpw1): 122

MALAGA (ESP MALAGA)

Latitude: 36°39'N Longitude: 4°29'W Altitude: 16 m

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

MALAGA (ESP MALAGA)

Latitude: 36°39'N Longitude: 4°29'W Altitude: 16 m

OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 1.81
 Mediterranean index of July.[PE/P].....(Im1): 150.33
 Mediterranean index of July & August.....(Im2): 300.24
 Mediterranean index of June, July & August....(Im3): 38.88

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp(x10)	640	480	531	759	381	201	99	10	0	300	729	960
Tp	128	122	128	142	167	195	228	250	258	236	197	156
Io (Iom)	5.01	3.93	4.15	5.36	2.29	1.03	0.43	0.04	0.00	1.27	3.70	6.17
Seasons	Winter			Spring			Summer			Autumn		
Pp(x10)/Tp	1651 / 378			1341 / 503			109 / 736			1989 / 589		
Io (Iot)	4.370			2.667			0.148			3.377		
Semesters	December-May						June-November					
Pp(x10)/Tp	2992 / 881						2098 / 1325					
Io (Iosm)	3.397						1.583					

MALAGA (ESP MALAGA)

Latitude: 36°39'N Longitude: 4°29'W Altitude: 16 m

Aridity Value Index (AVI)

[10xPP/TP=IO]: 5090/2206=2.31 **There is No Yearly Aridity**

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	640	480	531	759	381	201	99	10	0	300	729	960
Tp [T*10]	128	122	128	142	167	195	228	250	258	236	197	156
Iom [Pp/Tp]	501	393	415	536	229	103	43	4	0	127	370	617
Avm [200-Iom]	***	***	***	***	***	97	157	196	200	73	***	***
Seasons	Winter			Spring			Summer			Autumn		
Pp / Tp	1651 / 378			1341 / 503			109 / 736			1989 / 589		
Iot [Pp/Tp]	437			267			15			338		
Avs E[Avm<200]	***			***			553			***		
Lower ultrahyperarid [2]						Upper ultrahyperarid [1]						
Strong lower arid [1]						Strong lower semiarid [1]						
Weak lower semiarid [1]												

MALAGA (ESP MALAGA)

Latitude: 36°39'N Longitude: 4°29'W Altitude: 16 m

BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin]	(Sp):	13.61
CI of Gorezinski (1920) [1.7*Sp/sin(Lat)-20.4]		18.36
CI of Conrad (1946) [1.7*Sp/sin(Lat+10)-14]		17.82
+ Hyperoceanic (-20<CI<20)		
CI of Currey (1974) [CI=Sp/(1+Lat/3)]		1.03
+ Oceanic (0.6<CI<1.1)		
Rainfall Index of Lang (1925) [R=P/T]		27.69
+ Steppic (40>R>0)		
Aridity Index of Martonne (1926) [Ia=P/(T+10)]		17.93
+ Semiarid -mediterranean- (20>Ia>15)		
I of Emberger (1930) [Q=100*P/(Tmmax ² -Tmmin ²)]		63.84
+ Subhumid (90>Q>50)		
I of Dantin & Revenga (1940) [DR=100*T/P]		3.61
+ Arid (6>DR>3)		
Aridity Index of UNEP [I=P/PE]		0.55
+ Subhumid - dry (0.65>I>0.5)		
Potential Erosion I of Fournier (1960) [K=Pi ² /P]		18.11
+ Very low (K<60)		

MALAGA (ESP MALAGA)

Latitude: 36°39'N Longitude: 4°29'W Altitude: 16 m

BIOCLIMATIC INDICES II

Bioclimatic classification of Gaussen & Bagnouls (1957)
 + Climate

- + Climate
- + Region
- + Thermic type: 3. Macro-mesothermic

Thornthwaite (1948)												
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.23	0.25	0.36	0.16	0.07	0.03	0.00	0.00	0.10	0.30	0.45	0.31
T-E ratio	5.50	5.75	6.38	7.50	8.75	10.25	11.25	11.62	10.62	8.87	7.00	5.75
Precipitation-effectiveness: 22.56						Temperature-efficiency						99.26
Moisture Index [MI=100*(P-PE)/PE]												-44.74
+ D.Semiarid (-66.7<MI<-33.3)												
Index of dryness [DI=100*d/PE]												52.81
+ Strong deficit (33.3<DI)												
Index of humidity [HI=100*s/PE]												8.08
+ No surplus (0<HI<10)												
Potential Evapotranspiration PE												921.16
+ Third mesothermic (855<PE<997)												

