

# Phytosociological Research Center

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## Worldwide Bioclimatic Classification System

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(Adapted to Synoptical Table 30/08/2017)

MALAGA (ESP MALAGA)

Altitude: 500 m.

Latitude: 36°47'N Longitude: 4°23'W

Temperature observation period.: 1944-1969 (26)

Rainfall observation period....: 1944-1969 (26)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	EPI
Jan.	9.30	13.50	5.20	19.40	1.00	72.0	21.72
Feb.	9.60	13.60	5.60	19.80	1.90	78.0	22.59
Mar.	11.50	15.50	7.50	22.70	3.70	80.0	36.54
Apr.	13.10	17.40	8.90	23.50	5.30	55.0	48.05
May.	16.40	21.30	11.50	27.10	7.30	37.0	76.32
Jun.	19.90	25.10	14.70	31.40	10.50	10.0	104.84
Jul.	23.10	28.40	17.80	35.30	14.60	2.0	135.22
Aug.	23.40	28.90	17.90	35.20	14.70	4.0	129.20
Sep.	20.90	25.50	16.20	31.70	12.40	32.0	94.95
Oct.	16.90	21.10	12.60	26.70	8.30	55.0	63.67
Nov.	13.10	16.60	8.60	22.70	4.40	91.0	37.13
Dec.	10.00	13.80	6.20	19.40	2.10	97.0	23.55
Year	15.60	20.06	11.06	26.24	7.18	613	793.78

### BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	343
Compensated thermicity index.....(Itc):	343
Simple continentality index.....(Ic):	14.1
Diurnality index.....(Id):	11.0
Annual ombrothermic index.....(Io):	3.27
Monthly estival ombrothermic index.....(Ios1):	0.09
Bimonthly estival ombrothermic index.....(Ios2):	0.13
Threemonthly estival ombrothermic index.....(Ios3):	0.24
Fourmonthly estival ombrothermic index.....(Ios4):	0.64
Annual ombro-evaporation index.....(Ioe):	0.30
Annual positive temperature.....(Tp):	1872
Annual negative temperature.....(Tn):	0
Estival temperature.....(Ts):	664
Positive precipitation.....(Pp):	613

N. of	P>4T	P:2T-4T	PT-2T	P<T	T<0
Months	6	2	1	3	0

Latitudinal Belt...: Low eutemperate

Continentalty.....: Oceanic - High Euoceanic

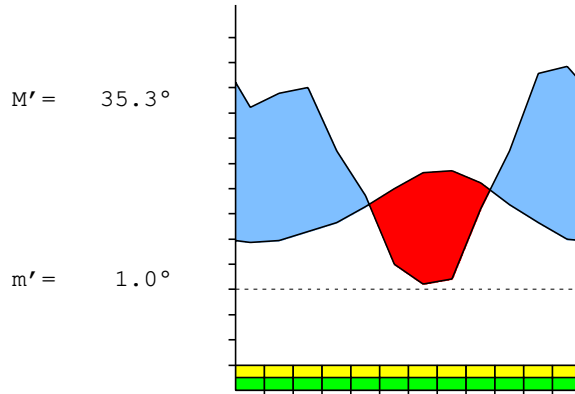
Bioclimate.....: MEDITERRANEAN PLUVISEASONAL-OCEANIC

Bioclimatic Belt...: LOW MESOMEDITERRANEAN UPPER DRY

MALAGA (ESP MALAGA)

500 m

P= 613      36° 47'N      4° 23'W      26/26 y.  
 T= 15.6°    Ic= 14.1      Tp= 1872      Tn= 0  
 m= 5.2°      M= 13.5°      Itc= 343      Io= 3.3



MEDITERRANEAN PLUVISEASONAL-OCEANIC  
 LOW MESOMEDITERRANEAN UPPER DRY

WATER INDEX CARD

MALAGA (ESP MALAGA)

Altitude: 500 m.

Latitude: 36° 47'N

(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jan.	9.3	22	72	0	100	22	0	50	32	2.3
Feb.	9.6	23	78	0	100	23	0	55	44	2.4
Mar.	11.5	37	80	0	100	37	0	43	44	1.1
Apr.	13.1	48	55	0	100	48	0	7	25	0.1
May.	16.4	76	37	-39	61	76	0	0	13	-0.5
Jun.	19.9	105	10	-61	0	71	34	0	6	-0.9
Jul.	23.1	135	2	0	0	2	133	0	3	-0.9
Aug.	23.4	129	4	0	0	4	125	0	2	-0.9
Sep.	20.9	95	32	0	0	32	63	0	1	-0.6
Oct.	16.9	64	55	0	0	55	9	0	0	-0.1
Nov.	13.1	37	91	54	54	37	0	0	0	1.4
Dec.	10.0	24	97	46	100	24	0	27	14	3.1
Year	15.6	794	613	*	*	430	364	183	183	*

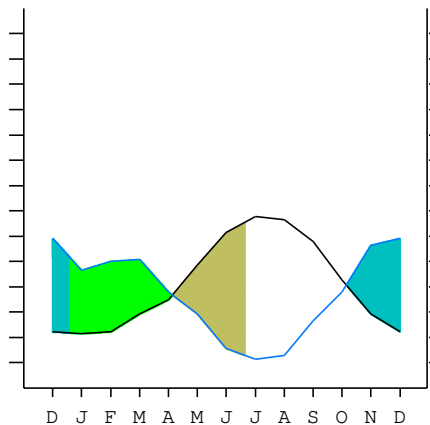
R = Reserve    VR = Variation of the reserve    RE = Real evapotranspiration  
 DR = Drainage    HC = Humidity coefficient    DF = Deficit    SP = Superavit

MALAGA (ESP MALAGA)

36°47'N    4°23'W    500 m 26/26 y.

T= 15.6    Ic= 14.1    MEDITERRANEAN PLUVISEASONAL-OCEANIC  
 m= 5.2    Tp= 1872    LOW MESOMEDITERRANEAN  
 M= 13.5    Tn= 0    UPPER DRY  
 M' = 35.3    Itc= 343  
 m' = 1.0    Io= 3.3  
 P= 613    mm    ———  
 PE= 794    mm    ———

Imbibing	5 Oct.
Saturation	19 Dec.
Reserve Use	5 Apr.
Deficit	20 Jun.



MALAGA (ESP MALAGA)

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SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continental Index [B2a]  
 + Type .....: B. Oceanic  
 + Subtype .....: 2. Euoceanic  
 + Variant .....: a. High  
 Thermic types [B1.A3]  
 + Latitudinal zone ....: B. Temperate  
 + Latitudinal belt ....: 1. Low eutemperate  
 + Thermic type .....: A. Warm  
 + Thermic subtype .....: 3. Subwarm  
 Bioclimatic types [B8.3b.5a]  
 + Macrobioclimate .....: B. MEDITERRANEAN  
 + Bioclimate .....: 8. PLUVISEASONAL-OCEANIC  
 + Bioclimatic variant ..:  
 + Thermic type.....: 3. MESOMEDITERRANEAN  
 + Thermic subtype.....: b. LOW  
 + Ombrothermic type ...: 5. DRY  
 + Ombrothermic subtype : a. UPPER  
 Bioclimatic Classification .....: Mehc.Mme.Dry

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PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 140  
 Coldest semester of the year.....(Psw): 473  
 Warmest four months period of the year.....(Pcm1): 48  
 Following warmest four months period.....(Pcm2): 315  
 Positive precipitation dryest 3 months.....(Ppd): 16  
 Positive precipitation dryest 2 months.....(Ppd2): 6  
 Positive precipitation dryest 1 month.....(Ppd1): 2  
 Positive precipitation warmest 3 months.....(Pps): 38  
 Positive precipitation warmest 2 months.....(Pps2): 6  
 Positive precipitation warmest 1 month.....(Pps1): 4  
 Positive precipitation coldest 3 months.....(Ppw): 247  
 Positive precipitation coldest 2 months.....(Ppw2): 150  
 Positive precipitation coldest 1 month.....(Ppw1): 72

Seasons	Winter Tr1-W	Spring Tr2-P	Summer Tr3-S	Automn Tr4-F
Rainfall	247	172	16	178

Seasonal rainfall rhythms: W > F > P > S

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TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 23.4  
 Average coldest month [T].....(Tmin): 9.3  
 Maximum temp. warmest month [M].....(Tmmax): 28.9  
 Minimum temp. coldest month [m].....(Tmmin): 5.2  
 Absolute Max.temp. warmest month [M'].....(Tamax): 35.3  
 Absolute Min.temp. coldest month [m'].....(Tamin): 1.0  
 First warmest contrasted month [M].....(Tcmax): 28.9 (8)  
 First coldest contrasted month [m].....(Tcmin): 17.9 (8)  
 Estival temperature.....(Ts): 664  
 Positive temperature dryest 3 months.....(Tpd): 664  
 Positive temperature dryest 2 months.....(Tpd2): 465  
 Positive temperature dryest 1 month.....(Tpd1): 231  
 Positive temperature warmest 3 months.....(Tps): 674  
 Positive temperature warmest 2 months.....(Tps2): 465  
 Positive temperature warmest 1 month.....(Tps1): 234  
 Positive temperature coldest 3 months.....(Tpw): 289  
 Positive temperature coldest 2 months.....(Tpw2): 189  
 Positive temperature coldest 1 month.....(Tpw1): 93

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

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## OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 1.29  
Mediterranean index of July.[PE/P].....(Im1): 67.61  
Mediterranean index of July & August.....(Im2): 44.07  
Mediterranean index of June, July & August....(Im3): 23.08

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp(x10)	970	720	780	800	550	370	100	20	40	320	550	910
Tp	100	93	96	115	131	164	199	231	234	209	169	131
Io (Iom)	9.70	7.74	8.12	6.96	4.20	2.26	0.50	0.09	0.17	1.53	3.25	6.95
Seasons	Winter			Spring			Summer			Autumn		
Pp(x10)/Tp	2470 / 289			1720 / 410			160 / 664			1780 / 509		
Io (Iot)	8.547			4.195			0.241			3.497		
Semesters	December-May						June-November					
Pp(x10)/Tp	4190 / 699						1940 / 1173					
Io (Iosm)	5.994						1.654					

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## Aridity Value Index (AVI)

[10xPP/TP=IO]: 6130/1872=3.27 **There is No Yearly Aridity**

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	970	720	780	800	550	370	100	20	40	320	550	910
Tp [T*10]	100	93	96	115	131	164	199	231	234	209	169	131
Iom [Pp/Tp]	970	774	812	696	420	226	50	9	17	153	325	695
Avm [200-Iom]	***	***	***	***	***	***	150	191	183	47	***	***
Seasons	Winter			Spring			Summer			Autumn		
Pp / Tp	2470 / 289			1720 / 410			160 / 664			1780 / 509		
Iot [Pp/Tp]	855			420			24			350		
Avs E[Avm<200]	***			***			524			***		
Lower ultrahyperarid [1]							Upper ultrahyperarid [1]					
Lower hyperarid [1]							Weak lower arid [1]					
Strong upper semiarid [1]												

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BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin] .....	(Sp): 14.10
CI of Gorezinski (1920) [1.7*Sp/sin(Lat)-20.4] .....	19.63
CI of Conrad (1946) [1.7*Sp/sin(Lat+10)-14] .....	18.89
+ Hyperoceanic (-20<CI<20)	
CI of Currey (1974) [CI=Sp/(1+Lat/3)] .....	1.06
+ Oceanic (0.6<CI<1.1)	
Rainfall Index of Lang (1925) [R=P/T] .....	39.29
+ Steppic (40>R>0)	
Aridity Index of Martonne (1926) [Ia=P/(T+10)] .....	23.95
+ Subhumid (30>Ia>20)	
I of Emberger (1930) [Q=100*P/(Tmax <sup>2</sup> -Tmin <sup>2</sup> )] .....	75.85
+ Subhumid (90>Q>50)	
I of Dantin & Revenga (1940) [DR=100*T/P] .....	2.54
+ Semiarid (3>DR>2)	
Aridity Index of UNEP [I=P/PE] .....	0.77
+ Humid (I>0.65)	
Potential Erosion I of Fournier (1960) [K=Pi <sup>2</sup> /P] .....	15.35
+ Very low (K<60)	

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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	0.40	0.43	0.41	0.26	0.15	0.03	0.00	0.01	0.11	0.23	0.45	0.54
T-E ratio	4.19	4.32	5.18	5.90	7.38	8.95	10.40	10.53	9.40	7.60	5.90	4.50
Precipitation-effectiveness: 30.41						Temperature-efficiency .....						84.24
Moisture Index [MI=100*(P-PE)/PE] .....												-22.77
+ C1.Subhumid dry (-33.3<MI<0)												
Index of dryness [DI=100*d/PE] .....												45.88
+ Strong deficit (33.3<DI)												
Index of humidity [HI=100*s/PE] .....												23.10
+ Strong surplus (20<HI)												
Potential Evapotranspiration PE .....												793.78
+ Second mesothermic (712<PE<855)												

