

# Phytosociological Research Center

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## Worldwide Bioclimatic Classification System

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(Adapted to Synoptical Table 30/08/2017)

TESSALIT (MALI)

Altitude: 520 m.

Latitude: 20°12'N Longitude: 0°59'E

Temperature observation period.: 1971-1980 (10)

Rainfall observation period....: 1960-1980 (21)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	Epi
Jan.	18.80	27.00	12.00	34.00	4.00	0.0	24.62
Feb.	21.60	30.00	14.00	38.00	4.00	0.0	44.11
Mar.	25.20	32.00	18.00	41.00	8.00	0.0	102.41
Apr.	29.70	37.00	22.00	44.00	12.00	0.0	169.17
May.	33.00	40.00	25.00	45.00	17.00	1.0	211.90
Jun.	35.20	43.00	28.00	46.00	21.00	2.0	227.70
Jul.	36.00	42.00	27.00	46.00	18.00	15.0	241.15
Aug.	33.70	40.00	26.00	45.00	16.00	51.0	214.37
Sep.	32.70	40.00	26.00	43.00	18.00	23.0	188.83
Oct.	30.30	37.00	24.00	42.00	11.00	2.0	165.92
Nov.	24.80	33.00	19.00	38.00	7.00	1.0	85.92
Dec.	19.80	28.00	14.00	35.00	3.00	0.0	30.90
Year	28.40	35.75	21.25	41.42	11.58	95	1707.0

### BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	674
Compensated thermicity index.....(Itc):	674
Simple continentality index.....(Ic):	17.2
Diurnality index.....(Id):	16.0
Annual ombrothermic index.....(Io):	0.28
Monthly dry ombrothermic index.....(Iod1):	No
Bimonthly dry ombrothermic index.....(Iod2):	No
Three monthly dry ombrothermic index.....(Iod3):	No
Four monthly dry ombrothermic index.....(Iod4):	No
Annual ombro-evaporation index.....(Ioe):	94.00
Annual positive temperature.....(Tp):	3408
Annual negative temperature.....(Tn):	0
Dry station temperature.....(Td):	656
Positive precipitation.....(Pp):	95

N. of	P>4T	P:2T-4T	PT-2T	P<T	T<0
Months	0	0	1	11	0

Latitudinal Belt...: Eutropical

Continentalty.....: Oceanic - Low Semicontinental

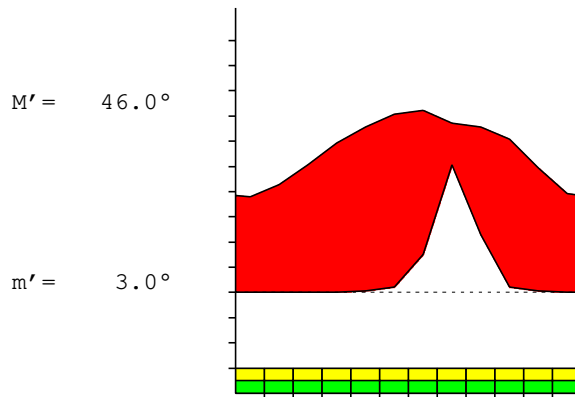
Bioclimate(Variant): TROPICAL DESERTIC (PLUVISEROTIN, HYPERARID)

Bioclimatic Belt...: UPPER INFRATROPICAL LOW HYPERARID

TESSALIT (MALI)

520 m

P= 95      20° 12'N      0° 59'E      10/21 y.  
 T= 28.4°    Ic= 17.2      Tp= 3408      Tn= 0  
 m= 12.0°    M= 27.0°      Itc= 674      Io= 0.3



TROPICAL DESERTIC (PLUVISEROTIN)  
 UPPER INFRATROPICAL LOW HYPERARID

WATER INDEX CARD  
 Altitude: 520 m.

TESSALIT (MALI)  
 Latitude: 20° 12'N

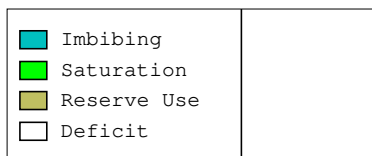
(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jan.	18.8	25	0	0	0	0	25	0	0	-1.0
Feb.	21.6	44	0	0	0	0	44	0	0	-1.0
Mar.	25.2	102	0	0	0	0	102	0	0	-1.0
Apr.	29.7	169	0	0	0	0	169	0	0	-1.0
May.	33.0	212	1	0	0	1	211	0	0	-0.9
Jun.	35.2	228	2	0	0	2	226	0	0	-0.9
Jul.	36.0	241	15	0	0	15	226	0	0	-0.9
Aug.	33.7	214	51	0	0	51	163	0	0	-0.7
Sep.	32.7	189	23	0	0	23	166	0	0	-0.8
Oct.	30.3	166	2	0	0	2	164	0	0	-0.9
Nov.	24.8	86	1	0	0	1	85	0	0	-0.9
Dec.	19.8	31	0	0	0	0	31	0	0	-1.0
Year	28.4	1707	95	*	*	95	1612	0	0	*

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

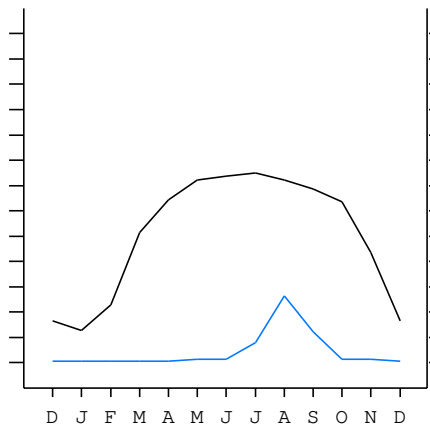
TESSALIT (MALI)

20°12'N    0°59'E    520 m 10/21 y.

T= 28.4    Ic= 17.2    TROPICAL DESERTIC (PLUVISEROTIN)  
 m= 12.0    Tp= 3408    UPPER INFRATROPICAL  
 M= 27.0    Tn= 0    LOW HYPERARID  
 M' = 46.0    Itc= 674  
 m' = 3.0    Io= 0.3  
 P= 95    mm    ———  
 PE= 1707    mm    ———



All over the year,  
 there is hydric deficit



TESSALIT (MALI)

Latitude: 20°12'N Longitude: 0°59'E Altitude: 520 m

SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continental Index [B1a]  
 + Type .....: B. Oceanic  
 + Subtype .....: 1. Semicontinental  
 + Variant .....: a. Low

Thermic types [A2.A1]  
 + Latitudinal zone ....: A. Warm  
 + Latitudinal belt ....: 2. Eutropical  
 + Thermic type .....: A. Warm  
 + Thermic subtype .....: 1. Torrid

Bioclimatic types [A2e.1a.2b]  
 + Macrobioclimate .....: A. TROPICAL  
 + Bioclimate .....: 2. DESERTIC  
 + Bioclimatic variant .: e. PLUVISEROTIN, HYPERARID  
 + Thermic type.....: 1. INFRATROPICAL  
 + Thermic subtype.....: a. UPPER  
 + Ombrothermic type ...: 2. HYPERARID  
 + Ombrothermic subtype : b. LOW

Bioclimatic Classification .....: Trps (Pse).Itr.Har

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PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 94  
 Coldest semester of the year.....(Psw): 1  
 Warmest four months period of the year.....(Pcm1): 69  
 Following warmest four months period.....(Pcm2): 26  
 Positive precipitation dryest 3 months.....(Ppd): 0  
 Positive precipitation dryest 2 months.....(Ppd2): 0  
 Positive precipitation dryest 1 month.....(Ppd1): 0  
 Positive precipitation warmest 3 months.....(Pps): 68  
 Positive precipitation warmest 2 months.....(Pps2): 17  
 Positive precipitation warmest 1 month.....(Pps1): 15  
 Positive precipitation coldest 3 months.....(Ppw): 0  
 Positive precipitation coldest 2 months.....(Ppw2): 0  
 Positive precipitation coldest 1 month.....(Ppw1): 0

Seasons	Dec+Jan+Feb Ttr1-1	Mar+Apr+May Ttr2-2	Jun+Jul+Aug Ttr3-3	Sep+Oct+Nov Ttr4-4
Rainfall	0	1	68	26

Tropical rainfall rhythms: 3 > 4 > 2 > 1

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TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 36.0  
 Average coldest month [T].....(Tmin): 18.8  
 Maximum temp. warmest month [M].....(Tmmax): 43.0  
 Minimum temp. coldest month [m].....(Tmmin): 12.0  
 Absolute Max.temp. warmest month [M'].....(Tamax): 46.0  
 Absolute Min.temp. coldest month [m'].....(Tamin): 3.0  
 First warmest contrasted month [M].....(Tcmax): 30.0 (2)  
 First coldest contrasted month [m].....(Tcmin): 14.0 (2)  
 Dry station temperature.....(Td): 656  
 Positive temperature dryest 3 months.....(Tpd): 656  
 Positive temperature dryest 2 months.....(Tpd2): 404  
 Positive temperature dryest 1 month.....(Tpd1): 188  
 Positive temperature warmest 3 months.....(Tps): 1049  
 Positive temperature warmest 2 months.....(Tps2): 712  
 Positive temperature warmest 1 month.....(Tps1): 360  
 Positive temperature coldest 3 months.....(Tpw): 602  
 Positive temperature coldest 2 months.....(Tpw2): 386  
 Positive temperature coldest 1 month.....(Tpw1): 188

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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): 17.97  
 Mediterranean index of July.[PE/P].....(Im1): No  
 Mediterranean index of July & August.....(Im2): No  
 Mediterranean index of June, July & August....(Im3): No

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp(x10)	0	0	0	0	0	10	20	150	510	230	20	10
Tp	198	188	216	252	297	330	352	360	337	327	303	248
Io (Iom)	0.00	0.00	0.00	0.00	0.00	0.03	0.06	0.42	1.51	0.70	0.07	0.04
Seasons	Dec+Jan+Feb			Mar+Apr+May			Jun+Jul+Aug			Sep+Oct+Nov		
Pp(x10)/Tp	0 / 602			10 / 879			680 / 1049			260 / 878		
Io (Iot)	0.000			0.011			0.648			0.296		
Semesters	December-May						June-November					
Pp(x10)/Tp	10 / 1481						940 / 1927					
Io (Iosm)	0.007						0.488					

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Aridity Value Index (AVI)

[10xPP/TP=IO]: 950/3408=0.28 Lower hyperarid (3) [2117]

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	0	0	0	0	0	10	20	150	510	230	20	10
Tp [T*10]	198	188	216	252	297	330	352	360	337	327	303	248
Iom [Pp/Tp]	0	0	0	0	0	3	6	42	151	70	7	4
Avm [200-Iom]	200	200	200	200	200	197	194	158	49	130	193	196
Seasons	Dec+Jan+Feb			Mar+Apr+May			Jun+Jul+Aug			Sep+Oct+Nov		
Pp / Tp	0 / 602			10 / 879			680 / 1049			260 / 878		
Iot [Pp/Tp]	0			1			65			30		
Avs E[Avm<200]	600			597			401			519		
Lower ultrahyperarid [11]						Lower hyperarid [1]						
Strong lower arid [1]						Weak lower arid [1]						
Strong upper arid [1]						Strong upper semiarid [1]						

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BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin] .....	(Sp):	17.20
CI of Gorezinski (1920) [1.7*Sp/sin(Lat)-20.4] .....		64.28
CI of Conrad (1946) [1.7*Sp/sin(Lat+10)-14] .....		44.13
+ Subcontinental (40<CI<60)		
CI of Currey (1974) [CI=Sp/(1+Lat/3)] .....		2.22
+ Continental (1.7<CI<2.3)		
Rainfall Index of Lang (1925) [R=P/T] .....		3.35
+ Steppic (40>R>0)		
Aridity Index of Martonne (1926) [Ia=P/(T+10)] .....		2.47
+ Extremely arid -desert- (5>Ia>0)		
I of Emberger (1930) [Q=100*P/(Tmmax <sup>2</sup> -Tmmin <sup>2</sup> )] .....		5.57
+ Arid (30>Q>0)		
I of Dantin & Revenga (1940) [DR=100*T/P] .....		29.89
+ Extremely arid (DR>6)		
Aridity Index of UNEP [I=P/PE] .....		0.06
+ Arid (0.2>Im>0.05)		
Potential Erosion I of Fournier (1960) [K=Pi <sup>2</sup> /P] .....		27.38
+ Very low (K<60)		

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BIOCLIMATIC INDICES II

Bioclimatic classification of Gaussen & Bagnouls (1957)

- + Climate .....
- + Region .....
- + Thermic type: 1. Megathermic

Thornthwaite (1948)

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
P-E ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.15	0.06	0.00	0.00	0.00	
T-E ratio	8.46	9.72	11.34	13.37	14.85	15.84	16.20	15.17	14.72	13.63	11.16	8.91	
Precipitation-effectiveness:	2.54						Temperature-efficiency .....						153.36
Moisture Index [MI=100*(P-PE)/PE] .....	-94.43												
+ E.Dry (-110<MI<-66.7)													
Index of dryness [DI=100*d/PE] .....	94.43												
+ Strong deficit (33.3<DI)													
Index of humidity [HI=100*s/PE] .....	0.00												
+ No surplus (0<HI<10)													
Potential Evapotranspiration PE .....	1706.98												
+ Megathermic (PE>1440)													

