

# Phytosociological Research Center

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## Worldwide Bioclimatic Classification System

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(Adapted to Synoptical Table 30/08/2017)

COLCHA K (BOLIVIA)

Altitude: 3700 m.

Latitude: 20°44'S Longitude: 67°40'W

Temperature observation period.: 1980-1991 (12)

Rainfall observation period....: 1980-1991 (12)

(C/mm)	Ti	Mi	mi	M'i	m'i	Pi	Epi
Jan.	13.20	20.20	6.20	24.40	2.40	67.0	76.70
Feb.	12.00	20.00	4.10	24.70	0.90	38.0	60.56
Mar.	11.90	17.80	4.60	23.10	0.70	33.0	63.05
Apr.	10.20	18.60	1.80	21.70	-2.70	3.0	49.83
May.	5.70	14.20	-2.90	21.60	-8.10	1.0	27.08
Jun.	5.00	13.20	-3.20	17.60	-7.00	1.0	22.71
Jul.	4.80	12.90	-3.40	16.70	-7.60	0.0	22.51
Aug.	6.60	16.70	-2.40	19.10	-6.30	1.0	33.06
Sep.	8.40	17.20	-0.50	20.50	-4.40	0.0	42.20
Oct.	10.00	19.10	0.90	22.30	-2.90	2.0	54.88
Nov.	11.70	20.30	3.00	23.80	-1.40	1.0	64.34
Dec.	12.70	20.80	4.50	24.10	-0.70	27.0	73.76
Year	9.35	17.58	1.06	21.63	-3.09	174	590.68

### BIOCLIMATIC INDICES AND DIAGNOSIS

Thermicity index.....(It):	188
Compensated thermicity index.....(Itc):	188
Simple continentality index.....(Ic):	8.4
Diurnality index.....(Id):	19.1
Annual ombrothermic index.....(Io):	1.55
Monthly dry ombrothermic index.....(Iod1):	No
Bimonthly dry ombrothermic index.....(Iod2):	0.09
Three monthly dry ombrothermic index.....(Iod3):	0.05
Four monthly dry ombrothermic index.....(Iod4):	0.08
Annual ombro-evaporation index.....(Ioe):	33.80
Annual positive temperature.....(Tp):	1122
Annual negative temperature.....(Tn):	0
Dry station temperature.....(Td):	198
Positive precipitation.....(Pp):	174

N. of	P>4T	P:2T-4T	PT-2T	P<T	T<0
Months	1	3	0	8	0

Latitudinal Belt...: Eutropical

Continentalty.....: Hyperoceanic - High Subhyperoceanic

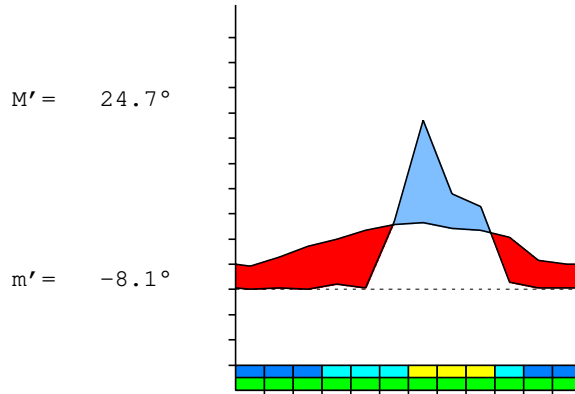
Bioclimate(Variant): TROPICAL XERIC (SEMIARID)

Bioclimatic Belt...: UPPER SUPRATROPICAL UPPER SEMIARID

COLCHA K (BOLIVIA)

3700 m

P= 174      20° 44'S      67° 40'W      12/12 y.  
 T= 9.3°      Ic= 8.4      Tp= 1122      Tn= 0  
 m= -3.4°      M= 12.9°      Itc= 188      Io= 1.6



TROPICAL XERIC (SEMIARID)  
 UPPER SUPRATROPICAL UPPER SEMIARID

WATER INDEX CARD      COLCHA K (BOLIVIA)  
 Altitude: 3700 m.      Latitude: 20° 44'S

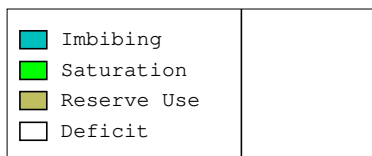
(C/mm)	T	PE	P	VR	R	RE	DF	SP	DR	HC
Jul.	4.8	23	0	0	0	0	23	0	0	-1.0
Aug.	6.6	33	1	0	0	1	32	0	0	-0.9
Sep.	8.4	42	0	0	0	0	42	0	0	-1.0
Oct.	10.0	55	2	0	0	2	53	0	0	-0.9
Nov.	11.7	64	1	0	0	1	63	0	0	-0.9
Dec.	12.7	74	27	0	0	27	47	0	0	-0.6
Jan.	13.2	77	67	0	0	67	10	0	0	-0.1
Feb.	12.0	61	38	0	0	38	23	0	0	-0.3
Mar.	11.9	63	33	0	0	33	30	0	0	-0.4
Apr.	10.2	50	3	0	0	3	47	0	0	-0.9
May.	5.7	27	1	0	0	1	26	0	0	-0.9
Jun.	5.0	23	1	0	0	1	22	0	0	-0.9
Year	9.3	591	174	*	*	174	417	0	0	*

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

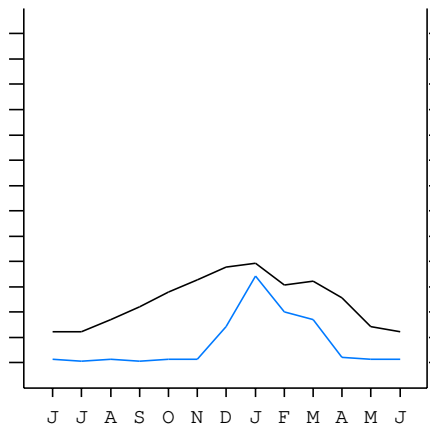
COLCHA K (BOLIVIA)

20°44'S      67°40'W      3700 m 12/12 y.

T= 9.3      Ic= 8.4      TROPICAL XERIC (SEMIARID)  
 m= -3.4      Tp= 1122      UPPER SUPRATROPICAL  
 M= 12.9      Tn= 0      UPPER SEMIARID  
 M' = 24.7      Itc= 188  
 m' = -8.1      Io= 1.6  
 P= 174      mm      ———  
 PE= 591      mm      ———



All over the year,  
 there is hydric deficit



COLCHA K (BOLIVIA)

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SUMMARY OF RIVAS-MARTINEZ CLASSIFICATION

Continental Index [A3a]  
 + Type .....: A. Hyperoceanic  
 + Subtype .....: 3. Subhyperoceanic  
 + Variant .....: a. High

Thermic types [A2.B5]  
 + Latitudinal zone .....: A. Warm  
 + Latitudinal belt .....: 2. Eutropical  
 + Thermic type .....: B. Temperate  
 + Thermic subtype .....: 5. Subtemperate

Bioclimatic types [A3.4a.4a]  
 + Macrobioclimate .....: A. TROPICAL  
 + Bioclimate .....: 3. XERIC  
 + Bioclimatic variant ..:  
 + Thermic type.....: 4. SUPRATROPICAL  
 + Thermic subtype.....: a. UPPER  
 + Ombrothermic type ...: 4. SEMIARID  
 + Ombrothermic subtype : a. UPPER

Bioclimatic Classification .....: Trxe.Str.Sar

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PRECIPITATION PARAMETERS

Warmest semester of the year.....(Pss): 169  
 Coldest semester of the year.....(Psw): 5  
 Warmest four months period of the year.....(Pcm1): 165  
 Following warmest four months period.....(Pcm2): 5  
 Positive precipitation dryest 3 months.....(Ppd): 1  
 Positive precipitation dryest 2 months.....(Ppd2): 1  
 Positive precipitation dryest 1 month.....(Ppd1): 0  
 Positive precipitation warmest 3 months.....(Pps): 132  
 Positive precipitation warmest 2 months.....(Pps2): 94  
 Positive precipitation warmest 1 month.....(Pps1): 67  
 Positive precipitation coldest 3 months.....(Ppw): 2  
 Positive precipitation coldest 2 months.....(Ppw2): 1  
 Positive precipitation coldest 1 month.....(Ppw1): 0

Seasons	Jun+Jul+Aug Ttr3-3	Sep+Oct+Nov Ttr4-4	Dec+Jan+Feb Ttr1-1	Mar+Apr+May Ttr2-2
Rainfall	2	3	132	37

Tropical rainfall rhythms: 1 > 2 > 4 > 3

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TEMPERATURE PARAMETERS

Average warmest month [T].....(Tmax): 13.2  
 Average coldest month [T].....(Tmin): 4.8  
 Maximum temp. warmest month [M].....(Tmmax): 20.8  
 Minimum temp. coldest month [m].....(Tmmin): -3.4  
 Absolute Max.temp. warmest month [M'].....(Tamax): 24.7  
 Absolute Min.temp. coldest month [m'].....(Tamin): -8.1  
 First warmest contrasted month [M].....(Tcmax): 16.7 (8)  
 First coldest contrasted month [m].....(Tcmin): -2.4 (8)  
 Dry station temperature.....(Td): 198  
 Positive temperature dryest 3 months.....(Tpd): 198  
 Positive temperature dryest 2 months.....(Tpd2): 98  
 Positive temperature dryest 1 month.....(Tpd1): 48  
 Positive temperature warmest 3 months.....(Tps): 379  
 Positive temperature warmest 2 months.....(Tps2): 259  
 Positive temperature warmest 1 month.....(Tps1): 132  
 Positive temperature coldest 3 months.....(Tpw): 155  
 Positive temperature coldest 2 months.....(Tpw2): 98  
 Positive temperature coldest 1 month.....(Tpw1): 48

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

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OMBROTHERMIC PARAMETERS

Annual aridity index.[PE/P].....(Iar): 3.39  
 Mediterranean index of January.....(Im1): No  
 Mediterranean index of January & February.....(Im2): No  
 Mediterranean index of December to February...(Im3): No

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp(x10)	270	670	380	330	30	10	10	0	10	0	20	10
Tp	127	132	120	119	102	57	50	48	66	84	100	117
Io (Iom)	2.13	5.08	3.17	2.77	0.29	0.18	0.20	0.00	0.15	0.00	0.20	0.09
Seasons	Dec+Jan+Feb			Mar+Apr+May			Jun+Jul+Aug			Sep+Oct+Nov		
Pp(x10)/Tp	1320 / 379			370 / 278			20 / 164			30 / 301		
Io (Iot)	3.483			1.331			0.122			0.100		
Semesters	December-May						June-November					
Pp(x10)/Tp	1690 / 657						50 / 465					
Io (Iosm)	2.572						0.108					

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Aridity Value Index (AVI)

[10xPP/TP=IO]: 1740/1122=1.55 **There is No Yearly Aridity**

Months	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Pp [P*10]	270	670	380	330	30	10	10	0	10	0	20	10
Tp [T*10]	127	132	120	119	102	57	50	48	66	84	100	117
Iom [Pp/Tp]	213	508	317	277	29	18	20	0	15	0	20	9
Avm [200-Iom]	***	***	***	***	171	182	180	200	185	200	180	191
Seasons	Dec+Jan+Feb			Mar+Apr+May			Jun+Jul+Aug			Sep+Oct+Nov		
Pp / Tp	1320 / 379			370 / 278			20 / 164			30 / 301		
Iot [Pp/Tp]	348			133			12			10		
Avs E[Avm<200]	***			***			565			571		
Lower ultrahyperarid [4]							Upper ultrahyperarid [5]					
Lower hyperarid [1]												

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BIOCLIMATIC INDICES I

CI of Supan (1884) [Tmax-Tmin] .....(Sp): 8.40  
 CI of Gorezinski (1920) [1.7\*Sp/sin(Lat)-20.4] .....: 19.94  
 CI of Conrad (1946) [1.7\*Sp/sin(Lat+10)-14] .....: 13.94  
 + 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] .....: 18.61  
 + Steppic (40>R>0)  
 Aridity Index of Martonne (1926) [Ia=P/(T+10)] .....: 8.99  
 + Arid -steppic- (15>Ia>5)  
 I of Emberger (1930) [Q=100\*P/(Tmax<sup>2</sup>-Tmin<sup>2</sup>)] .....: 41.32  
 + Semiarid (50>Q>30)  
 I of Dantin & Revenga (1940) [DR=100\*T/P] .....: 5.37  
 + Arid (6>DR>3)  
 Aridity Index of UNEP [I=P/PE] .....: 0.29  
 + Semiarid (0.5>Im>0.2)  
 Potential Erosion I of Fournier (1960) [K=Pi<sup>2</sup>/P].....: 25.80  
 + 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: 5. Meso-microthermic

Thornthwaite (1948)												
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
P-E ratio	0.32	0.18	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.12
T-E ratio	5.94	5.40	5.35	4.59	2.56	2.25	2.16	2.97	3.78	4.50	5.26	5.71
Precipitation-effectiveness: 8.07						Temperature-efficiency .....: 50.49						
Moisture Index [MI=100*(P-PE)/PE] .....: -70.54 + E.Dry (-110<MI<-66.7)												
Index of dryness [DI=100*d/PE] .....: 70.53 + Strong deficit (33.3<DI)												
Index of humidity [HI=100*s/PE] .....: 0.00 + No surplus (0<HI<10)												
Potential Evapotranspiration PE .....: 590.68 + First mesothermic (570<PE<712)												

