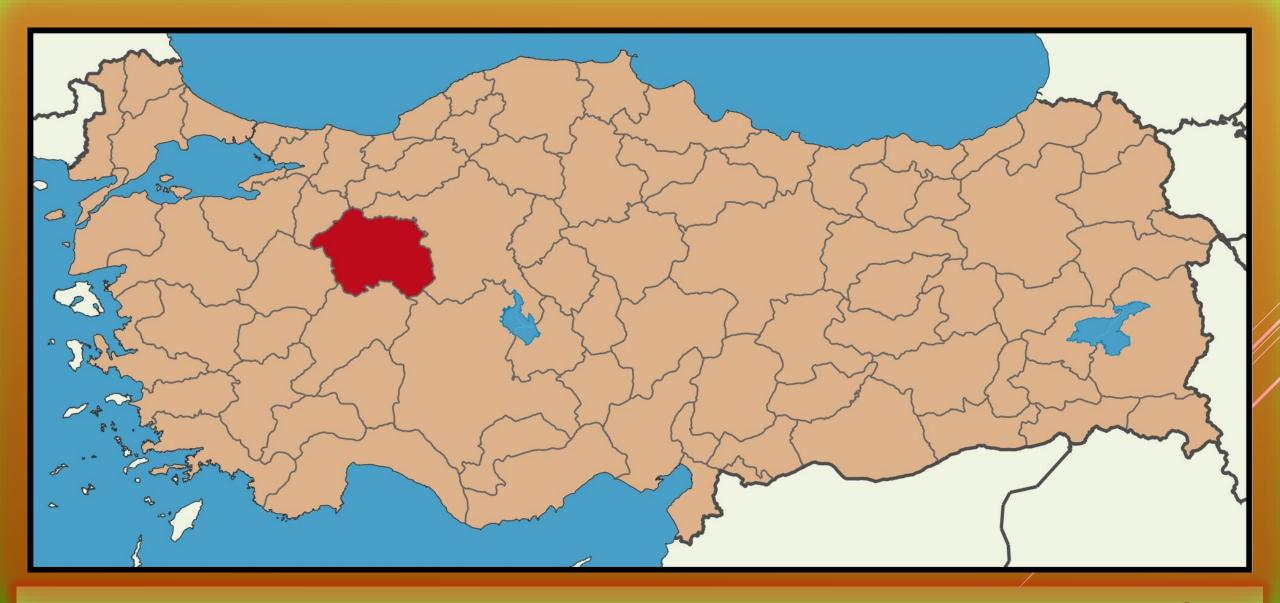
# DETERMINATION OF CHEMICAL AND PHYSICAL ANALYSIS TOLERANCE OF SOME ASSOCIATIONS DETECTED IN GYPSIFEROUS AND MARLY SOILS IN ESKİŞEHİR

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Eskişehir is located on the northwest side of Central Anatolia region between 29° 58' and 32° 04' east longitude and 39° 06' ve 40° 09' north latitude.



The area of Eskisehir is 13.901 km2. Eskisehir covers 1,7 % area of Turkey. The adjacent provinces of Eskisehir are ;Ankara to the east, Konya and Afyon to the south, Kütahya and Bilecik to the west, Bilecik, Bolu and Ankara to the North.

The city center is 801 m above sea level.



Some of the significant floristic diversity of Turkey are, edafic, geologic and geomorphologic varieties and topographical structures.



The reason of high endemism in the soils thriving on the rocks and including extreme ecological conditions such as Gyps and Marl soils is explained as a geological isolation. These regions are named geologic island or edafic.







Marl consist of natural various combinaiton of clay and calcium carbonate. When calcium carbonate amount is higher than clay, it's called limestone.



Gypsum is a mineral that chemical compound is calcium sulphate. The variant which has two molecules of crystal water ( $CaSO_4 + 2 H_2O$ ) is called gypsum. Gypsiferous, Gypsiferous-Marl types of bedrock are very suitable for the endemic species (Akman, 2014).

Region Reserv	of Appo	irent The Mo	st Mean	
Kütahya	5	29	15	
Denizli	1	2	1,5	
Niğde	25	1000	62,5	
Sivas	50	500	275	
<b>Eskişehir</b>	12	<mark>20</mark>	<mark>16</mark>	
Ankara	2	10	6	
Kars	20	30	25	
Çankırı	50	500	275	
Total	165	1190	670	

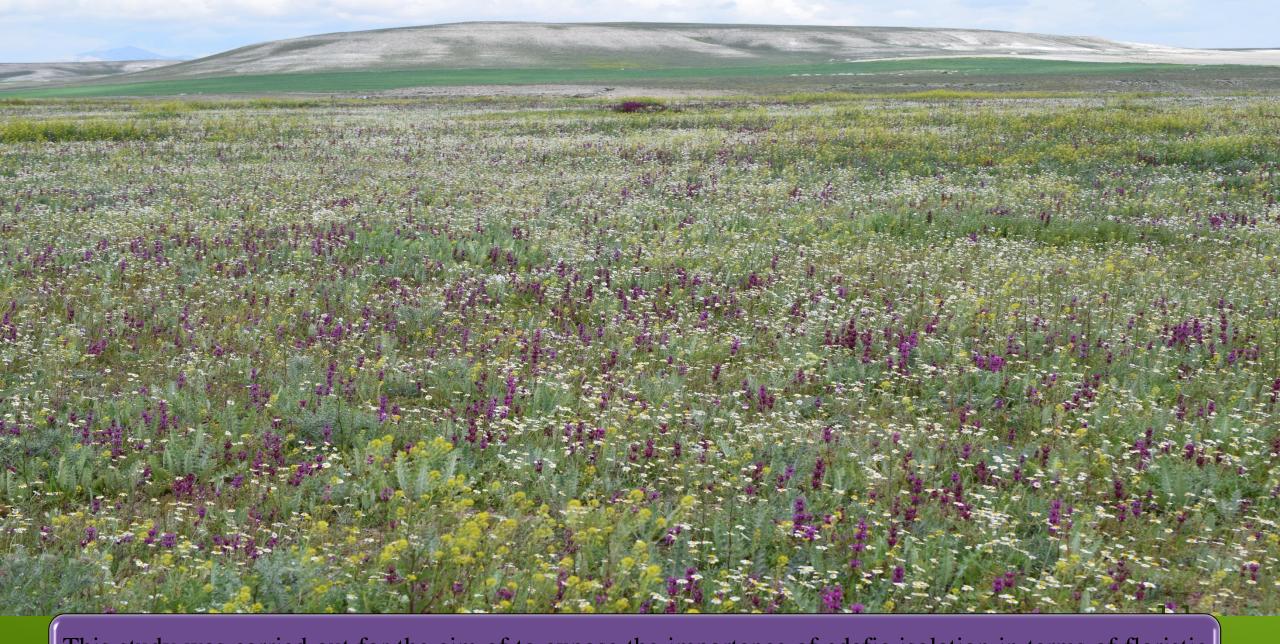


Reserves of Turkey Gypsum

Lake formed sediment rocks show a wide spread in the region of Eskişehir. Limestone, dolomite, sepiolite, meerschaum and gypsum formations reside in this region which also has industrial applications.







This study was carried out for the aim of to expose the importance of edafic isolation in terms of floristic diversity and endemism.

The flora of Turkey is represented 1.220 genus and 11.707 species and sub-species which belong to 154 family.

Turkey is one of the country that has the richest flora in the World with 11.707 species and sub-species taxa.

#### Floristic Statement of Steppe in Central Anatolia

According to the study of Turkey's Flora the number of species is more than 2.000 (two thousands). The number of endemic species is higher in Central Anatolia as well as floristic richness (Akman, 2014).

In the steppes of Central Anatoia particularly species of Labiatae, Scrophulariaceae, Caryophyllaceae, Crucifera, Boraginaceae, Cistaceae and Leguminosae families are predominate (Akman, 2014).

	Natural	Endemic	%	Wild	Agriculture	Total
Lycopsida	13	1	8,00	0	0	13
Pteridophyta	73	2	2,74	0	0	73
Gymnospermae	37	6	16,00	4	1	42
Angiospermae	11343	3640	32,09	167	69	11579
Total	11466	3649	31,82	171	70	11707

#### Floristic summery of Turkey (Güner et al., 2012)







Distrubitions of the Obtained Plants According to the Large Plant Groups

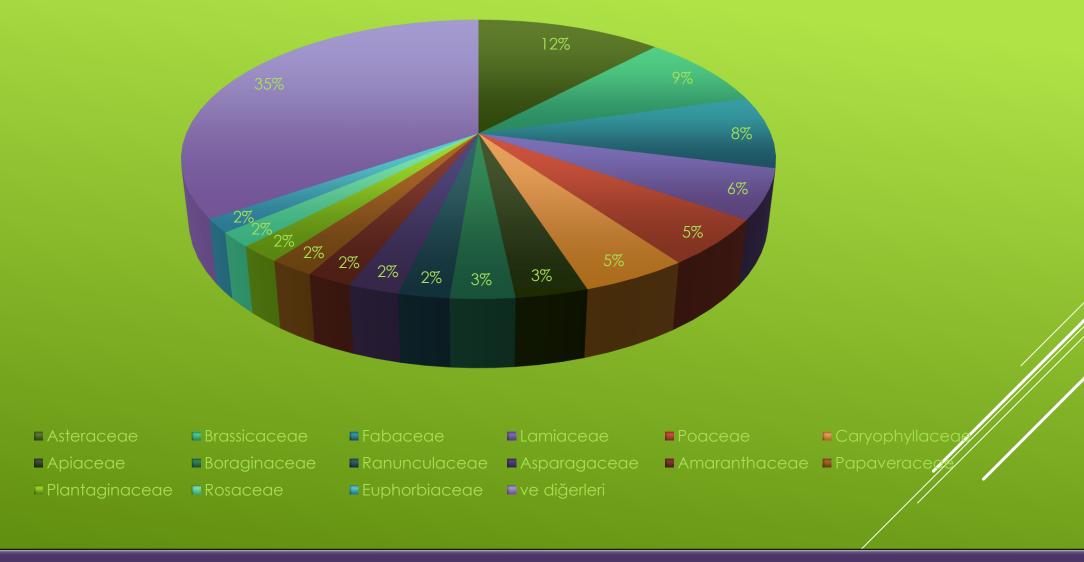
	Family	Taxa
Spermatophyta		
Gymnospermae	3	4
Angiospermae		
Dicotyledonae	60	637
Monocotyledonae	9	96
Total	72	737

As the result of the investigations and diagnoses; 354 genus, and 737 species and sub-species taxa that all are under 72 families were determined in the research field,

The determined families have 69 Angiospermae, 3 Gymnospermae and 60 of the Angiospermae are dicotyl, 9 of Angiospermae are monocotyl,

351 of the genus are Angiospermae, 3 of the genus are Gymnospermae. 329 of the genus are dicotyl and 22 of the genus are monocotyl.





Family of Asteraceae take apart in the first place of taxa according to the number of species and sub-species which were determined to be specific to the gypsum and marl soils.

Phytogeographic Regions	Number of Taxa	%
Europe-Siberia	38	5,1
Mediterranean	42	5,6
Iran-Turan	152	20,6
E.Mediterranean	27	3,6
Blacksea	1	0,1
Unknown or Multi Regional	477	64,7
Endemic	129	17,5





Spectrum of Phytogeographic Regions

In the determined taxa, 152 of them are in Iran-Turan, 42 of them are in Mediterranean, 27 of them are in East-Mediterranean, 38 of them are in Europe-Siberia and 1 of them is in Blacksea phytogeographic region. The phytogeographic regions of 477 of them are unknown or they are multi regional.

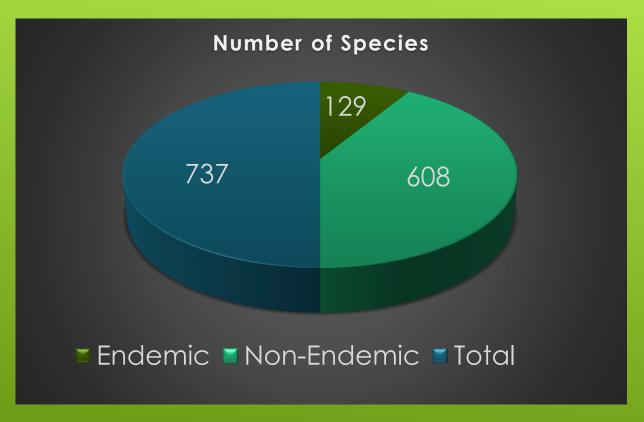
#### The richest families in the working area

No	Name of Family	Nummber of Species	Ratio ( % )
1	Asteraceae	98	13,29
2	Brassicaceae	70	9,49
3	Fabaceae	68	9,22
4	Lamiaceae	47	6,73
5	Poaceae	44	5,97
6	Caryophyllaceae	40	5,42
7	Apiaceae	27	3,66
8	Boraginaceae	24	3,25
9	Ranunculaceae	19	2,57
10	Asparagaceae	19	2,57
11	Amaranthaceae	17	2,30
12	Papaveraceae	17	2,30
13	Plantaginaceae	16	2,17
14	Rosaceae	14	1,89
15	Euphorbiaceae	13	1,76
16	Others	282	38,26
	Total	737	100



The richest families in the working area

#### The ratio of Endemism of the Species in the Working

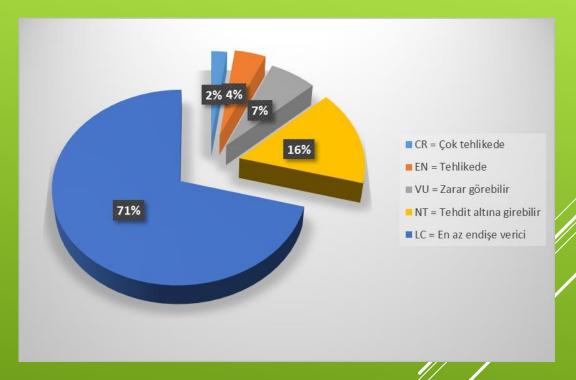


The ratio of Endemism of the Species in the Working Area

In the working area 129 Endemic taxa are determined so far, and the ratio of it is approximately 17,5 %

# Distribution of Endemic and Non-Endemic Species According to Red List of IUCN

Categories of Red List	Endemics	Non-Endemics
EX = Extinct	-	-
EW = Extinct in the wild	-	-
CR = Critically endangered	3	1
EN = Endangered	6	-
VU = Vulnerable	9	2
NT = Near threatened	22	-
LC = Least concern	97	5
DD = Data deficient	_	
Total	137	8



Distribution of Species according to Red List.

In The Categories of Endemic Taxa; 6 of them are in EN, 3 of them are in CR, 9 of them are in VU, 22 of them are in NT and 97 of them LC

#### Some Views of Working Area



The vegetation of the area was studied according to Braun-Blanquet approach and classified into 7 associations. Associations and their higher units are as follows:

Class: Astragalo-Brometea (Quezel, 1973)

Class: Onobrychido armenae-Thymetalia leucostomi Akman, Ketenoglu, Quézel

Alyans: Artragalo karamasici- Gypsophilion eriocalycis Quézel et Demirörs 1984

1. Association: Saponario kotschyii-Aethionemetum dumani ass. nova

2. Association: Salvio wiedemannii-Artemidetum campestrii ass. nova

3. Association: Anthemido gypsicolae-Centauredetum niveae ass. nova

4. Association: Hedysario pestalozzae- Convolvuletum phrygiae ass. nova

5. Association: Paronychio caricae- Convolvuletum pulvinatii ass. nova

6. Association: Lino cariensae-Fumanetum paphlagonicae ass. nova

7. Association: Gypsophilo viscosae-Thymetum longicaulii ass. nova

### Comparison of Soil Analyzes According to Plant Associations

In the study area, 59 soil samples were taken from the places that could best characterize the plant associations.

#### **Physical Analysis**

Soil specimens taken from 0-20 and 20-40 cm depth were taken from places where plant units were found. There are silt loamy, sandy loamy, loamy, silt, clay, sandy clay, and sandy clay constructions in associations soil.

			Fizik	sel Analizler		
			%			
Soil Number	Localite  Localite	Moisture	CLAY	SILT	SAND	Structure
2	L 5 DEMIRCIK To - 6 GÜNYÜZÜ	3,95 1,19	11,16 9.23	72,88 24,29	15,96 66.48	Silt loamy Sand loamy
3	To 88 - 101	3.64	7,23	48.49	66,48 44.12	Sana loamy
4	10 00 - 101	5,84	9,64	86.65	3.71	Silt
5	To 152-153-154	3.71	73.84	8.31	17.83	Clay
6	To - 104 - 107	3,71	26,09	29.08	44,83	Loamy
7	117 - 122	2,09	9,32	69,45	21,23	Siltli loamy
8	L4 To-37-39	4,40	78,58	14,64	6,78	Clay
9	L4 To4 ÖA4	5,48	79,47	6,35	14,18	Clay
10	To 102-103	2,40	7,30	41,72	50,98	Sand loamy
11	ACANTHOLIMON	2,56	81,20	6,16	12,64	Clay
12	To 1 alpu bozan yolu sol tepeler	3,58	38,08	14,52	47,40	Sand Clay loamy
13	ÖA 42 - 43	3,73	69,72	8,31	21,97	Clay
14	L1 T1 YAZIR	3,21	7,36	42,07	50,57	Sand loamy
15	To 135 - 136	3,57	66,37	9,04	24,59	Clay
16	To 158 - 159	4,31	86,86	4,18	8,96	Clay
17	ÖA 13 L 8	4,09	47.05	2.84	50.12	Sand Clay
18	To 138 - 139	2,16	76,94	5,56	17,50	Clay
19	To 21 - 25 BOZAN	2,65	47,09	14,38	38,53	Clay
20	ÖA 10 L5	2,24	48,94	17,10	33,96	Clay
21	ÖA9 L4	2,41	38,77	22,54	38,68	Clay loamy
22	L1 ÖA7	2,56	59,36	20,52	20,12	Clay
23	ÖA 14 L9 To 14	1,83	9,45	27,95	62,60	Sand loamy
24	To 164-165-166-167(Num. Yok)	0,00	0,00	0,00	0,00	0
25	ÖA 19 To 19 L14	3,94	52,64	16,07	31,29	Clay
26	To 141-146	4,03	44,35	14,59	41,07	Clay
27 28	To 7 L5 L1 A. KEPEN SİVRİHİSAR	3,20 5.02	11,65	52,40 18.95	35,95 18.64	Silt loamy
28	To 76	5,02	62,41 9,23	70,64	20,13	Clay Silt loamy
29 30	171-172	235	9,23 40.87	17.29	20,13	Silf loamy Clay
31	L6	3,60	40,17	13,36	46,47	Sand Clay
32	ÖA 16 L11 To 11	1.25	10.13	33.30	56.58	Sand Loamy
33	To 21	4.28	73.88	12.70	13.41	Clay
34	178	2,99	41,23	22,10	36,66	Clay
35	To 160-161-162-163	3,33	70,34	9,02	20,64	Clay
36	To 131-132-133	2,27	8,19	45,76	46,06	loamy
37	ÖA 17 L12 To12	4,79	14,54	54,62	30,85	Siltli Loamy
38	To 20	4,14	8,18	39,64	52,18	Sand Loamy
39	To 2/33 L2	5,29	44,18	19,76	36,06	Clay
40	ÖA 60-72 To	5,95	47,98	24,16	27,87	Clay
41	ÖA - 170	1,53	40,46	14,22	45,32	Sand Clay
42	ÖA 12 L7	3,89	51,86	22,89	25,25	Clay
43	To 130 ÖA 127-128-129-130	0,95	9,93	38,37	51,70	loamy
44 45	To 9	4,00	59,50	19,50 12.54	21,00	Clay
45	To 148	4,33	60,46 49.04	12,54	27,00	Clay
46	ÖA 18 L13 To 13	2,45	49,04 69,50	12,30	18,21	Clay
48	ÖA 73 To 73	3,85	8,15	68,64	23.20	Siltli loamy
49	ÖA 61 6 To 6	4.65	70.39	14.68	14.93	Clay
50	ÖA 15 L10 To 15	1.97	11.34	37.46	51.20	loamy
51	To 19	7,94	64,22	10,86	24,92	Clay
52	To 16	3,47	51,63	10,36	38,01	Clay
53	okunmuyor iptal	4,38	54,21	20,92	24,87	Clay
54	To 2 ÖA 2 L 2	5,07	81,24	11,29	7,47	Clay
55	ÖA168-169 nasrettin hoca	3,02	47,27	36,38	16,36	Clay
56	180-183	5,21	62,37	2,87	34,76	Clay
57	173-175	2,93	56,79	21,35	21,87	Clay
58	176-177	5,56	86,66	2,12	11,23	Clay
59	179	4,56	57,75	23,81	18,44	Clay

# Physical analysis results of soil samples

Soil specimens were taken 5-20 cm deep. The soil structures and min.-max. values of the associations are given in the table below.

Accociations	Chu, ali wa	Clay rate		Silt rate		Sand rate	
Associations	Structure	Min.(%)	Max. (%)	Min. (%)	Max. (%)	Min. (%)	Max. (%)
Saponario kotschyii-Aethionemetum dumanii	Sandy loamy, clay and silts	9.32	47.04	9.04	69.45	24.59	62.60
	loamy						22.12
Salvio wiedemannii-Artemidetum campestrii	Clay loamy, clay and silts loamy	9.23	73.88	12.70	72.88	13.41	38.68
Anthemido gypsicolae-Centauredetum niveae	Clay and silt loamy	9.25	86.86	4.18	70.64	8.96	38.66
Hedysario pestalozzae- Convolvuletum phrygiae	clay, sandy clay, loamy and silt loamy	7.39	86.66	2.12	69.45	6.78	52.18
Paronychio caricae- Convolvuletum pulvinatii	Clay and loamy	7.45	73.86	8.31	48.49	13.41	56.58
Lino cariensae- Fumanetum paphlagonicae	Clay, loamy and silt loamy	8.19	85.07	8.15	69.45	69.45	46.06
Gypsophilo viscosae-Thymetum longicaulii	Silt loamy and loamy clay	7.40	76.94	5.56	86.65	3.71	51.70

1 7.43 0.07863 0.8462 33.9619 4.122 117.4973 Gyppum 2 7.741 0.0244 3.5544 12.3498 3.9903 4.2175 Gyppum 3 7.48 0.068 3.1766 52.4865 4.4655 93.393 (gypsum 5 5.626 0.0131 2.1366 69.4675 2.6908 57.2422 Mard 6 7.96 0.0108 3.9473 67.9237 5.267 72.365 Mard 8 8.04 0.0359 3.2288 67.9237 3.893 75.3187 Mard 8 8.04 0.0359 3.2288 67.9237 3.893 75.3187 Mard 10 7.66 0.0482 2.5008 43.2242 1.4865 48.204 Gyppum 11 8.09 0.0166 2.208 86.449 4.2051 18.3404 Mard 12 8.01 0.0142 3.9426 88.6449 4.4083 132,551 Mard 13 8.18 0.0156 3.9483 81.812 1.603 75.3187 Mard 14 7.81 0.0393 3.4383 537.0493 1.3167 44.204 Gyppum 14 7.81 0.0393 3.4395 37.0493 1.3167 42.204 Gyppum 15 8.2 0.0188 2.8837 78.7289 3.7213 42.110 Mard 16 8.33 0.017 2.7279 64.8363 2.519 132.551 Mard 16 8.33 0.017 2.7279 64.8363 2.519 132.551 Mard 17 8.19 0.027 3.0393 38.5247 2.20 222.22.5425 Gypsum 18 8.22 0.0114 2.7666 83.3609 5.725 100.459 Mard 19 8.3 0.0005 1.9477 52.4855 3.455 87.3608 Gypsum 19 8.3 0.0005 1.9477 52.4855 3.455 87.3608 Gypsum 19 8.3 0.0005 1.9477 52.4855 3.455 87.3608 Gypsum 22 8.51 0.0147 3.855 37.166 2.261 1.77.306 Mard 23 7.98 0.0122 4.6706 74.0986 2.061 77.306 Mard 24 7.99 0.0124 4.5706 74.0986 2.061 77.306 Mard 24 7.99 0.0147 3.3598 67.9237 2.1183 8.4343 Mard 25 8.01 0.0147 3.855 37.106 3.3508 1.3443 Mard 26 8.11 0.0147 3.855 37.106 2.2611 77.306 Mard 27 7.96 0.0347 3.3698 7.7186 1.374 66.2855 Gypsum 28 8.11 0.0147 3.855 37.106 3.3508 2.275 3.3143 Mard 29 7.96 0.0056 2.6889 7.7186 1.374 66.2855 Gypsum 20 8.11 0.0147 3.855 37.006 2.2611 77.306 Mard 21 7.99 0.0122 4.5706 74.0986 2.2611 77.306 Mard 22 7.99 0.0122 4.5706 74.0986 2.261 77.356 Mard 23 7.68 0.0056 2.5889 7.7186 1.374 66.2855 Gypsum 24 7.99 0.0127 3.3598 67.9237 2.1183 8.4484 Mard 24 7.99 0.0127 3.3598 67.9237 2.1183 8.4484 Mard 24 7.99 0.0127 3.3598 67.9237 2.1183 8.4484 Mard 24 7.99 0.0127 3.3598 67.3598 67.9237 2.1183 8.4485 Mard 24 7.99 0.0128 3.3588 67.3598 7.3598 67.3598 67.3598 67.3598 67.3598 67.3598 67.3598 67.3598 67.3598 67.3598 67.3598 67.3598 67.3598 67.3598 67.3598 67.3598 67.3598 6	Soil Number	Ph	Total Salt (%)	Organic substances (%)	Lime (%)	Phosphorus (P2O5)	Potassium (IK2O)	Soil Type
3 7.48 0.068 3.1768 52.4865 4.4655 93.3953 Gyptom 4 7.57 0.0695 1.8389 41.6805 4.4083 2017.878 Gyptom 5 8.26 0.0131 2.1368 69.4675 2.6908 57.2423 Mad 6 7.96 0.0100 3.9473 67.9237 3.567 77.2505 Mad 8 8.04 0.0359 3.2288 67.9237 3.8993 75.3187 Mad 9 9.06 0.022 2.738 3.8993 75.3187 Mad 10 7.66 0.0482 2.5008 43.2242 1.4885 48,204 Gyptom 11 8.09 0.0166 2.2008 38,6484 2.061 3.1343 Mad 12 8.01 0.0142 3.9426 58,6614 4.4083 1325,561 Mad 13 8.18 0.0196 3.4888 81.8172 1.603 75.3187 Mad 14 7.81 0.0393 3.4935 37.0493 1.3167 48,204 Gyptom 15 8.2 0.0188 2.8837 78.7298 3.7213 1.3167 48,204 Gyptom 16 8.33 0.017 2.7229 64,8363 2.519 132,551 Mad 17 8.19 0.027 3.0539 18,5247 2.29 222,2455 Gyptom 18 8.2. 0.0174 2.7566 83,3609 5.725 108,649 Mad 19 8.3 0.0088 1.9477 52,4865 3.3435 87,3698 Gyptom 19 8.3 0.0085 1.9477 52,4865 3.3435 87,3698 Gyptom 19 8.3 0.0085 1.9477 52,4865 3.3435 87,3698 Gyptom 20 8.11 0.014 2.776 88,9047 2.29 122,9435 Gyptom 21 7.91 0.0122 4.5706 74,0986 2.661 77,306 Mad 22 8.01 0.0147 1.7727 84,9047 2.1183 81,3443 Mad 23 7.68 0.026 2.5898 7,7166 1.374 66,2805 Gyptom 24 7.99 0.017 1.772 84,9047 2.1183 81,3443 Mad 24 7.99 0.017 2.9215 4.5706 74,0986 2.661 77,306 Mad 27 7.79 0.0447 3.6668 3.7181 2.8855 1.8858 Gyptom 24 7.79 0.0447 3.6668 3.7181 2.8855 1.8858 Gyptom 25 8.07 0.0125 3.3928 67,9237 2.1183 96,438 Mad 34 8.12 0.0134 3.9197 1.0112 1.9198 5.4225 Mad 35 8.02 0.033 3.938 3.939 3.3140 5.9438 Mad 36 7.8 0.0068 3.002 9.5623 7.557 331,4025 Gyptom 37 7.79 0.0447 3.6668 3.74181 2.8858 Mad 38 7.77 0.0457 3.3919 1.8899 2.4618 2.8425 13.9588 Mad 38 7.77 0.0457 3.3919 1.8899 2.4618 2.8425 13.8588 Mad 38 7.77 0.0457 3.3919 1.8899 2.4618 2.8425 13.8588 Mad 38 8.02 0.033 3.3957 3.1488 1.1448 Mad 39 7.8 0.0068 3.002 9.5623 7.557 331,4025 Gyptom 44 0.811 0.0077 0.6049 2.0068 1.19455 349,479 Gyptom 45 7.79 0.0457 3.3919 1.8899 2.4618 2.2425 Mad 47 7.79 0.0457 3.3919 1.8899 2.4618 2.2428 Mad 48 7.79 0.0558 3.3185 3.3185 3.3185 Mad 49 7.77 0.0457 3.3195 3.3888 3.3888 Mad 40 7.77 0.0457 3.3195 3.3889 3.3889 3.3888 Mad 41 7.79 0.0	1	7,43						
4 7.57 0.0895 1,8389 41,6805 4,4083 207,8798 Gypsum 5 8, 2,6 0.0131 2,1368 69,4675 2,5908 55,7423 Mad 6 7,96 0.0108 3,9473 57,9337 5,267 72,205 Mad 7 8,08 0.0123 1,176 66,4484 3,893 7,5319 Mad 8 8,04 0,0559 3,2288 67,9237 3,393 75,31127 Mad 10 7,66 0,0482 2,5008 43,2242 1,4885 48,204 Gypsum 11 8,09 0,0166 2,206 86,4484 2,616 81,3443 Mad 11 8,09 0,0166 2,206 86,4484 2,616 81,3443 Mad 12 8,01 0,0142 3,942 5,86614 4,083 132,561 Mad 13 8,18 0,0196 3,4884 81,8172 1,603 75,3187 Mad 14 7,81 0,093 3,4935 37,0493 1,3167 48,204 Gypsum 15 8,2 0,0188 2,8837 78,7298 3,7213 24,102 Mad 16 8,33 0,017 2,7722 64,836 2,519 132,561 Mad 17 8,19 0,007 3,0339 18,5247 2,29 22,9435 Gypsum 18 8,23 0,0174 2,7466 83,3609 5,725 108,459 Mad 18 8,33 0,0085 1,9477 5,74956 1,249	2	7,41	0,0244	3,5644	12,3498	3,9503	42,1785	Gypsum
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17 8,19 0,027 3,0539 18,5247 2,29 222,9435 Gypsum 18 8,23 0,0174 2,7466 83,3609 5,725 100,469 Marl 19 8,3 0,0085 1,9477 52,4865 3,435 87,3696 Gypsum 20 8,11 0,014 3,855 74,0966 2,26 72,306 Marl 21 7,91 0,0122 4,6766 74,0986 2,261 72,306 Marl 22 8,01 0,0147 1,7727 84,9047 2,1183 81,3443 Marl 23 7,68 0,026 2,6998 7,7186 1,374 66,2805 Gypsum 25 8,07 0,0125 3,9284 67,9237 2,1183 96,438 Marl 26 8,11 0,0137 3,7109 71,0112 2,9198 54,2255 Marl 27 7,69 0,0347 3,6966 32,4181 2,8625 138,5865 Marl 28 8,05 0,0232 3,5549 61,7488 2,8625 138,5865 Marl 29 7,86 0,0608 3,030 9,2623 7,557 331,4025 Gypsum 30 8,16 0,0137 1,6404 89,5536 2,6908 81,3443 Marl 31 8,12 0,0142 2,5008 88,6514 1,9465 45,1313 Marl 32 7,8 0,0438 3,895 21,6121 1,3433 7,5319 Gypsum 33 8,02 0,0331 3,0775 61,7488 1,7748 138,5865 Marl 34 8,12 0,0134 3,919 71,0112 1,832 114,4845 Marl 34 8,12 0,0134 3,919 71,0112 1,832 114,4845 Marl 36 7,8 0,0608 3,244 52,4865 1,7748 38,1658 Gypsum 39 8,06 0,0137 1,6004 89,5536 2,6008 Marl 34 8,12 0,0154 3,919 71,0112 1,832 114,4845 Marl 36 7,8 0,0608 3,244 52,4865 1,7748 38,1658 Gypsum 39 8,06 0,0147 3,1579 2,00684 2,4045 2,5088 Marl 41 8 0,0054 3,456 80,273 4,468 2,2328 138,5865 Marl 42 8,12 0,0157 3,1342 58,6614 2,1183 99,4208 Marl 44 8,0054 3,4586 80,273 4,668 83,2		-		-	- "			
18								
19   8,3   0,0085   1,9477   52,4865   3,435   87,3698   Gypsum   20   8,11   0,014   3,853   74,0986   2,29   77,305   Marl   21   7,91   0,0122   4,6706   74,9986   2,761   72,305   Marl   22   8,01   0,0147   1,7777   84,9047   2,1183   81,3443   Marl   22   7,68   0,026   2,6698   7,7185   1,374   66,2805   Gypsum   24   7,99   0,017   2,9215   46,3116   2,1183   201,8543   Marl   24   7,99   0,017   2,9215   46,3116   2,1183   201,8543   Marl   25   8,07   0,0125   3,9284   67,9237   2,1183   96,438   Marl   26   8,11   0,0137   3,7109   71,0112   2,9198   54,4225   Marl   27   7,69   0,0347   3,6966   32,4181   2,8625   195,756   Gypsum   28   8,05   0,0232   3,5549   61,7488   2,8625   138,5855   Marl   31   8,12   0,0142   2,5008   38,6614   1,9465   45,1913   Marl   31   8,12   0,0142   2,5008   38,6614   1,9465   45,1913   Marl   31   8,12   0,0142   2,5008   3,8653   21,6121   1,4131   7,5319   Gypsum   33   8,02   0,0331   3,075   61,7488   1,7488   138,8855   Marl   34   8,12   0,0134   3,919   71,0112   1,832   114,4855   Marl   34   8,12   0,0157   3,1342   58,6614   2,1183   159,6088   Marl   34   8,12   0,0157   3,1342   58,6614   2,1183   159,6088   Marl   34   8,12   0,0157   3,1342   58,6614   2,1183   199,6088   Marl   34   8,12   0,0157   3,1342   58,6614   2,1183   199,6088   Marl   36   7,8   0,0668   3,748   52,4865   1,748   39,1658   Gypsum   37   7,87   0,0973   3,64   55,574   2,1183   99,4208   Marl   34   8,12   0,0157   3,1342   58,6614   2,1183   99,4208   Marl   34   8,12   0,0157   3,1342   58,6614   2,1183   99,4208   Marl   34   8,12   0,0157   3,1342   58,6614   2,1183   99,4208   Marl   34   8,12   0,0054   3,4968   50,0068   3,746   52,4865   3,758   Marl   34   8,12   0,0054   3,4968   50,0068   3,446   52,4865   349,479   69,950m   44   8,11   0,0027   0,6949   2,00684   1,9465   349,479   69,950m   44   8,11   0,0027   0,6949   2,00684   1,9465   349,479   69,950m   44   8,11   0,0027   0,6949   2,00684   3,935   3,935   3,935   3,935   3,935   3,935   3,935   3,935		-						
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29 7,86 0,0608 3,0302 9,2623 7,557 331,4025 Gypsum 30 8,16 0,0137 1,6404 89,5358 2,6608 81,3443 Marl 31 8,12 0,0142 2,5008 58,6614 1,9465 45,1913 Marl 32 7,8 0,0438 3,8953 21,6121 1,4313 7,5319 Gypsum 33 8,02 0,0331 3,0775 61,7488 1,7748 138,5865 Marl 34 8,12 0,0134 3,919 71,0112 1,832 114,4845 Marl 35 8,12 0,0157 3,1342 58,6614 2,1183 159,6058 Marl 36 7,8 0,0608 3,744 52,4865 1,7748 39,1658 Gypsum 37 7,87 0,0973 3,64 55,574 2,1183 99,4208 Marl 38 7,77 0,0457 3,919 16,9809 2,4618 24,102 Gypsum 40 8,11 0,0277 0,6949 20,0684 2,4045 250,0583 Gypsum 40 8,11 0,0277 0,6949 20,0684 1,9465 349,479 Gypsum 41 8 0,0054 3,4368 80,2735 4,0648 63,2678 Marl 42 8,12 0,0203 3,2666 58,6614 2,2328 138,5865 Marl 43 7,81 0,0281 2,444 9,2623 1,832 18,0765 Gypsum 44 7,79 0,0353 3,1862 66,38 4,9235 20,4867 Gypsum 45 7,88 0,0258 3,016 60,2051 5,3815 135,5738 Marl 47 8,42 0,0123 2,1718 1,7861 2,2328 87,3698 Marl 48 7,86 0,0619 3,2900 32,4181 2,6908 110,6375 Gypsum 49 8,11 0,0289 66,38 2,6142 210,8925 3,664 Gypsum 49 8,11 0,0289 66,38 2,6142 210,8925 3,664 Gypsum 49 8,11 0,0289 66,38 3,619 1,17487 Gypsum 49 8,11 0,0289 66,38 3,614 210,8925 3,664 Gypsum 49 8,11 0,0289 66,38 3,614 210,8925 3,664 Gypsum 49 8,11 0,0289 66,38 3,614 210,8925 3,664 Gypsum 49 8,11 0,0289 66,38 3,614 210,8925 3,664 Gypsum 49 8,11 0,0289 66,38 3,614 210,8925 3,664 Gypsum 49 8,11 0,0289 66,38 3,614 210,8925 3,664 Gypsum 49 8,11 0,0289 66,38 3,614 210,8925 3,664 Gypsum 49 8,11 0,0289 66,38 3,614 210,8925 3,664 Gypsum 50 7,55 0,0529 3,5544 33,9619 4,122 117,4973 Gypsum 51 7,86 0,0619 3,2900 32,4181 2,6908 110,6375 Gypsum 52 8,08 0,021 2,8695 66,38 3,1488 114,4845 Marl 53 7,94 0,0261 3,5077 64,8363 1,832 99,4208 Marl 54 8,22 0,0296 2,2077 49,3991 3,8358 241,02 Gypsum 55 8,29 0,0144 3,3044 1,1488 4,0648 126,5355 Marl 56 8,13 0,0297 1,16829 74,0986 3,893 105,4463 Marl	27	7,69	0,0347	3,6968	32,4181	2,8625	159,5758	Gypsum
30 8,16 0,0137 1,6404 89,5358 2,6908 81,3443 Maril 31 8,12 0,0142 2,5008 58,6614 1,9465 45,1913 Maril 32 7,8 0,0438 3,955 21,6121 1,4313 7,5319 Gypsum 33 8,02 0,0331 3,0775 61,7488 1,7748 138,5865 Maril 34 8,12 0,0134 3,919 71,0112 1,832 114,4845 Maril 35 8,12 0,0157 3,1342 58,6614 2,1183 159,6058 Maril 36 7,8 0,0608 3,744 52,4865 1,7748 39,1658 Gypsum 37 7,87 0,0973 3,64 55,574 2,1183 99,4208 Maril 38 7,77 0,0457 3,919 16,9809 2,4618 24,102 Gypsum 40 8,11 0,0277 0,6949 20,0684 2,4045 250,0583 Gypsum 40 8,11 0,0277 0,6949 20,0684 1,9465 349,479 Gypsum 41 8 0,0054 3,3468 80,2735 4,0648 63,2678 Maril 42 8,12 0,0203 3,2666 58,6614 2,2328 138,5865 Maril 43 7,81 0,0281 2,444 9,2623 1,832 18,0765 Gypsum 44 7,79 0,0353 3,1862 66,38 4,9235 204,867 Gypsum 45 7,88 0,0258 3,016 60,2051 5,3815 135,5738 Maril 46 7,82 0,0306 4,3113 77,1861 2,2328 138,5865 Maril 47 8,42 0,0123 2,5197 78,7298 1,9465 39,1658 Gypsum 49 8,11 0,0281 2,444 9,2623 1,832 18,0765 Gypsum 45 7,88 0,0258 3,016 60,2051 5,3815 135,5738 Maril 47 8,42 0,0123 2,5197 78,7298 1,9465 39,1658 Maril 48 7,86 0,0619 3,2902 32,4181 2,6908 150,6375 Gypsum 49 8,11 0,0289 66,38 2,6142 210,8925 3,664 Gypsum 50 6,38 3,1488 114,4845 Maril 50 7,55 0,0529 3,5644 33,9619 1,374 250,0588 Gypsum 52 8,08 0,021 2,8695 66,38 3,1488 114,4845 Maril 53 7,94 0,0261 3,5077 64,8363 1,832 99,4208 Maril 53 7,94 0,0261 3,5077 64,8363 1,832 99,4208 Maril 53 7,94 0,0261 3,5077 64,8363 1,832 99,4208 Maril 50 6,88 3,1488 114,4845 Maril 55 8,29 0,0144 3,000 4,	28	8,05	0,0232	3,5549	61,7488	2,8625	138,5865	Marl
31 8,12 0,0142 2,5008 58,6614 1,9465 45,1913 Mark  32 7,8 0,0438 3,8953 21,6121 1,4313 7,5319 Gypsum  33 8,02 0,0331 3,0775 61,7488 1,7748 138,8,865 Mark  34 8,12 0,0134 3,919 71,0112 1,832 114,4845  35 8,12 0,0157 3,1342 58,6614 2,1183 159,6058 Mark  36 7,8 0,0608 3,744 52,4865 1,7748 39,1658 Gypsum  37 7,87 0,0973 3,64 55,574 2,1183 99,4208 Mark  38 7,77 0,0457 3,919 16,9809 2,4618 24,102 Gypsum  40 8,11 0,0277 0,6949 20,0684 2,4045 250,0583 Gypsum  40 8,11 0,0277 0,6949 20,0684 1,9465 349,479 Gypsum  41 8 0,0054 3,4368 80,2735 4,0448 652,2678 Mark  42 8,12 0,0203 3,2666 58,6614 2,2328 138,5865 Mark  43 7,81 0,0281 2,444 9,2623 1,832 18,0765 Gypsum  44 7,79 0,0353 3,1862 66,38 4,9325 204,867 Gypsum  45 7,88 0,0258 3,016 60,2051 5,3815 135,5738 Mark  46 7,82 0,0306 4,3113 77,1861 2,2228 87,3698 Mark  47 8,42 0,0123 2,5197 78,7298 1,9465 39,1658 Gypsum  49 8,11 0,0289 66,38 2,6142 210,8925 3,664 Gypsum  51 7,8 0,0427 1,3946 33,9619 4,122 117,4973 Gypsum  51 7,8 0,0427 1,3946 33,9619 4,122 117,4973 Gypsum  51 7,8 0,0427 1,3946 33,9619 1,374 250,0583 Gypsum  52 8,08 0,021 2,8695 66,38 3,1488 114,4845 Mark  53 7,94 0,0261 3,5077 64,8363 1,832 99,4208 Mark  55 8,29 0,0144 3,044 61,7488 4,0648 126,5355 Mark  56 8,13 0,0297 2,2177 72,559 1,8893 174,7395 Mark  57 8,2 0,0171 1,6829 74,0986 3,893 105,4463 Mark	29	7,86	0,0608	3,0302	9,2623	7,557	331,4025	Gypsum
32 7,8 0,0438 3,8953 21,6121 1,4313 7,5319 Gypsum 33 8,02 0,0331 3,0775 61,7488 1,7748 138,5865 Maril 34 8,12 0,0134 3,919 71,0112 1,832 114,4845 Maril 35 8,12 0,0157 3,1342 58,6614 2,1183 159,6058 Maril 36 7,8 0,0608 3,744 52,4865 1,7748 39,1658 Gypsum 37 7,87 0,0973 3,64 55,574 2,1183 99,4208 Maril 38 7,77 0,0457 3,919 16,9809 2,4618 24,102 Gypsum 39 8,06 0,0147 3,1579 20,0684 2,4045 250,0583 Gypsum 40 8,11 0,0277 0,6949 20,0684 2,4045 250,0583 Gypsum 41 8 0,0054 3,4368 80,2735 4,0648 63,2678 Maril 42 8,12 0,0203 3,2666 58,6614 2,2328 138,5865 Maril 43 7,81 0,0281 2,444 9,2623 1,832 18,0765 Gypsum 44 7,79 0,0353 3,1862 66,38 4,9235 204,867 Gypsum 45 7,88 0,0258 3,016 60,2051 5,3815 135,5738 Maril 47 7,82 0,0306 4,3113 77,1861 2,2328 87,3698 Maril 48 7,86 0,0619 3,2902 32,4181 2,6908 150,6375 Gypsum 49 8,11 0,0289 66,38 2,6142 210,8925 3,664 Gypsum 50 7,55 0,0529 3,5644 33,9619 4,122 117,4973 Gypsum 51 7,8 0,0427 1,3946 33,9619 1,374 250,0583 Gypsum 52 8,08 0,021 2,8695 66,38 3,1488 114,4845 Maril 53 7,94 0,0261 3,5077 64,8363 1,832 99,4208 Maril 54 8,22 0,0396 2,2077 49,3991 3,8358 241,02 Gypsum 55 8,29 0,0144 3,0444 61,7488 4,0648 126,5355 Maril 56 8,13 0,0297 2,2171 72,5549 1,8893 176,54463 Maril	30	8,16	0,0137	1,6404	89,5358	2,6908	81,3443	Marl
33 8,02 0,0331 3,0775 61,7488 1,7748 138,5865 Maril 34 8,12 0,0134 3,919 71,0112 1,832 114,4845 Maril 35 8,12 0,0157 3,1342 58,6614 2,1183 159,6058 Maril 36 7,8 0,0608 3,744 52,4865 1,7748 39,1658 Gypsum 37 7,87 0,0973 3,64 55,574 2,1183 99,4208 Maril 38 7,77 0,0457 3,919 16,9809 2,4618 24,102 Gypsum 39 8,06 0,0147 3,1579 20,0684 2,4045 250,0583 Gypsum 40 8,11 0,0277 0,6949 20,0684 1,9465 349,479 Gypsum 41 8 0,0054 3,4368 80,2735 4,0648 63,2678 Maril 42 8,12 0,0203 3,666 58,6614 2,2328 138,5856 Maril 43 7,81 0,0281 2,444 9,2623 1,832 188,0765 Gypsum 44 7,79 0,0353 3,1862 66,38 4,9235 204,867 Gypsum 45 7,88 0,0258 3,016 60,2051 5,3815 135,5738 Maril 46 7,82 0,0306 4,3113 77,1861 2,2328 87,3698 Maril 47 8,42 0,0123 2,5197 78,7298 1,9465 39,1653 Maril 48 7,86 0,0619 3,2902 32,4181 2,6908 150,6375 Gypsum 50 7,55 0,0529 3,5644 33,9619 1,374 250,0583 Gypsum 50 7,55 0,0529 3,5644 33,9619 1,374 250,0583 Gypsum 51 7,8 0,0427 1,3946 33,9619 1,374 250,0583 Gypsum 52 8,08 0,021 2,8695 66,38 3,1488 114,4845 Maril 53 7,94 0,0261 3,5077 64,8363 1,832 99,4208 Maril 56 8,13 0,0297 2,2171 72,5549 1,8893 174,7395 Maril 57 8,2 0,0171 1,6829 74,0986 3,893 105,4463 Maril	31	8,12	0,0142	2,5008	58,6614	1,9465	45,1913	Mari
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50     7,55     0,0529     3,5644     33,9619     4,122     117,4973     Gypsum       51     7,8     0,0427     1,3946     33,9619     1,374     250,0583     Gypsum       52     8,08     0,021     2,8695     66,38     3,1488     114,4845     Maril       53     7,94     0,0261     3,5077     64,8363     1,832     99,4208     Maril       54     8,22     0,0296     2,2077     49,3991     3,8358     241,02     Gypsum       55     8,29     0,0144     3,0444     61,7488     4,0648     126,5355     Maril       56     8,13     0,0297     2,2171     72,5549     1,8893     174,7395     Maril       57     8,2     0,0171     1,6829     74,0986     3,893     105,4463     Maril	49	8,11	0,0289	66,38	2,6142	210,8925	3,664	_
51         7,8         0,0427         1,3946         33,9619         1,374         250,0583         Gypsum           52         8,08         0,021         2,8695         66,38         3,1488         114,4845         Maril           53         7,94         0,0261         3,5077         64,8363         1,832         99,4208         Maril           54         8,22         0,0296         2,2077         49,3991         3,8358         241,02         Gypsum           55         8,29         0,0144         3,0444         61,7488         4,0548         126,5355         Maril           56         8,13         0,0297         2,2171         72,5549         1,8893         174,7395         Maril           57         8,2         0,0171         1,6829         74,0986         3,893         105,4463         Maril	50	7,55	0,0529	3,5644	33,9619	4,122	117,4973	Gypsum
53     7,94     0,0261     3,5077     64,8363     1,832     99,4208     Marl       54     8,22     0,0296     2,2077     49,3991     3,8858     241,02     Gypsum       55     8,29     0,0144     3,0444     61,7488     4,0648     126,5355     Marl       56     8,13     0,0297     2,2171     72,5549     1,8893     174,7395     Marl       57     8,2     0,0171     1,6829     74,0986     3,893     105,4463     Marl	51	7,8	0,0427	1,3946	33,9619	1,374	250,0583	
54     8,22     0,0296     2,2077     49,3991     3,8858     241,02     Gypsum       55     8,29     0,0144     3,0444     61,7488     4,0648     126,5355     Maril       56     8,13     0,0297     2,2171     72,5549     1,8893     174,7395     Maril       57     8,2     0,0171     1,6829     74,0986     3,893     105,4463     Maril		7		2,8695	66,38	3,1488	114,4845	Maril
55     8,29     0,0144     3,0444     61,7488     4,0648     126,5355     Maril       56     8,13     0,0297     2,2171     72,5549     1,8893     174,7395     Maril       57     8,2     0,0171     1,6829     74,0986     3,893     105,4463     Maril	53	7,94	0,0261	3,5077	64,8363	1,832	99,4208	Mari
56         8,13         0,0297         2,2171         72,5549         1,8893         174,7395         Maril           57         8,2         0,0171         1,6829         74,0986         3,893         105,4463         Maril						3,8358		Gypsum
57 8,2 0,0171 1,6829 74,0986 3,893 105,4463 Maril								
58 8.36 0.0279 3.1295 57.1177 1.4313 114.4825 Mark			-		- 7		-	
		_	-		57,1177			
59 7,92 0,0301 3,172 50,9428 4,7518 165,7013 Gypsum	59	7,92	0,0301	3,172	50,9428	4,7518	165,7013	Gypsum

# Chemical analysis results of soil samples

- 1. Phosphorus (P2O5) determination in plants: According to the Olsen method, the amount of phosphorus passing through the soil extract using 0.5 M sodium bicarbonate (pH: 8,5) was found by spectrophotometer (Bremner, 1965).
- **2. Potassium (K2O) available to plants:** The flammable photometric potassium principle is the principle of potassium flame photometer readout method of extracting potassium from the soil with ammonium acetate solution.
- **3. Determination of organic matter:** The determination of organic matter in soils is based on the Smith and Weldon method (Smith and Weldon, 1941).
- **4. Calcium carbonate (CaCO3) determination:** Volumetric method using calmeter.
- **5. Total salt (EC) determination:** Calculated by measuring the electrical conductivity of the water extract in the soil (USDA, 1954).
- **6. Soil reaction (pH):** Soil sature is prepared by adding pure water to the ground and determined by zerometric pH meter with glass electrode in saturating paste.

Associations	PH		LIA	ΛE	ORGANIC MATERIAL(%)	
	Min.	Max.	Min.	Max.	Min.	Max.
Saponario kotschyii-Aethionemetum dumanii	7.68	8.3	7.7	86.4	1.71	2.88
Salvio wiedemannii-Artemidetum campestrii	7.43	9.92	9.26	74.09	0.06	4.67
Anthemido gypsicolae-Centauredetum niveae	7.82	8.33	9.26	77.18	0.69	4.31
Hedysario pestalozzae- Convolvuletum phrygiae	7.48	8.36	20.06	86.44	1.94	4.31
Paronychio caricae- Convolvuletum pulvinatii	7.48	8.42	20.06	78.72	0.69	3.89
Lino cariensae- Fumanetum paphlagonicae	7.55	8.33	20.06	86.44	0.69	4.31
Gypsophilo viscosae-Thymetum longicaulii	7.43	8.26	9.26	83.36	0.84	3.74

Associations	TOTAL SALT(%)			Phosphorus (P <sub>2</sub> O <sub>5</sub> )kg/da		Potassium (K <sub>2</sub> O) kg/da	
	Min.	Max.	Min.	Max.	Min.	Max.	
Saponario kotschyii-Aethionemetum dumanii	0.0085	0.0188	1.374	3.893	7.5319	87.3698	
Salvio wiedemannii-Artemidetum campestrii	0.0147	0.07863	1.7748	7.557	72.306	331.4025	
Anthemido gypsicolae-Centauredetum niveae	0.0147	0.0306	1.9465	7.557	87.3698	349.479	
Hedysario pestalozzae- Convolvuletum phrygiae	0.0085	0.068	1.4313	5.267	24.102	250.0583	
Paronychio caricae- Convolvuletum pulvinatii	0.0085	0.068	1.4313	4.4655	7.5319	349.479	
Lino cariensae- Fumanetum paphlagonicae	0.0085	0.0608	1.7748	4.122	7.5319	349.479	
Gypsophilo viscosae-Thymetum longicaulii	0.0131	0.07863	1.7748	7.557	18.0765	331.4025	

# РН

Plant roots absorb the nutrients in the soil at best pH values of 6.5-7.5.

• It is difficult to obtain nutrients from plants below or above these values.

As the acidity in the soil increases, the cell membranes of the plant roots become deteriorated and the permeability increases, and the matter passes from inside the cell to the outside.

• As a result, the plant can not benefit from its nutrients.

There is a close relationship between pH values and availability of plant nutrients.

In some cases, changing the pH value of the medium makes it difficult for plants to utilize the nutrients in the soil.

- Because when the pH value changes, the insoluble compounds of the nutrients may still be present.
- In this case plants can not take these substances
- •

# TOTAL SALT

Soil salinity indicates the amount of soluble salts present in the soil in the unit volume. In the soils there are mostly cations such as sodium, calcium, magnesium and potassium with anions such as chlorine, sulphate, carbonate and bicarbonate.

These anions and cations in the soil combine to form salts. These anions and cations are so salty that they damage the plant.

Salinity affects the structure of soil negatively, reduces water retention capacity, prevents water intake of plant roots. Apart from these, some elements such as sodium, chlorine and boron which are high in the structure of soluble salts show toxic effect for plants.

# LIME

- As the amount of lime in the soil increases, calcium, iron and phosphorus ions in the environment form compounds with very low solubility.
- Because these compounds are insoluble in water, they can not be used by plants.

# LIME

- Phosphorus availability decreases as excess calcareous soils form compounds such as phosphorus, calcium phosphate or magnesium phosphates.
- The fact that the amount of lime is too low is too bad for plant nutrition.

# LIME

- Because of the high content of aluminum, iron and manganese in the acidearth soil, these elements react with phosphorus, reducing the phosphorus availability.
- The application of the pyrethrum to such soil increases the availability of phosphorus because aluminum, iron and manganese will become inactive.

The organic matter has an important effect on the physical, chemical and biological properties of the soil. The physical properties of the soil, such as its ability to acquire a good structure, increase the water holding capacity, maintain its aeration and temperate state, is largely related to organic matter.

### ORGANIC MATERIAL

Organic matter sees the storage of plant nutrients in the soil.

The organic matter helps to convert the inorganic phosphorus, iron, manganese and other elements in the soil into useful forms for the plants.

Carbon dioxide is released during the continuous decomposition of organic matter by microorganisms. Carbonic acid increases the solubility of other elements.

Phosphorus

• Phosphorus contents of plants are generally between 0.2-0.8% of dry weight. In the case of deficiency, this ratio falls below 0,1%. Phosphorus is found in the seeds and fruits of the plant more than leaves and other parts.

Phosphorus

• Although there are different symptoms due to the lack of phosphorus and the rate of deficiency, the root system can not develop in general, the plants can not grow normally, the fruits are poor, the product is poor and poor quality and the ripening is delayed.

Phosphorus

• Often fruity shows deformity, dark red color and cracks. Phosphorus excess; potassium, calcium, iron, copper and zinc. It is found in the form of phosphorus pentaoxide (P2O5) which is close to the whole of the phosphorus in the plant and the soil.

# Potassium

Potassium is an important nutrient for plant growth and proliferation. Potassium provides water balance and plants production and transport of photosynthesis products.

Activates some enzyme systems.

Potassium is very important especially in terms of fruits. Potassium is responsible for the durability of the fruit; there is a positive effect on the increase of fat and starch ratios.

If there is too much phosphorus in the soil, it will prevent early ripening.
Potassium excess can cause magnesium and calcium deficiency.

	Lovest	Highest	
	Achillea gypsicola HubMor.	Scabiosa hololeuca Bornm.	
	Convolvulus phrygius Bornm	Sideritis gulendamii H.Duman & Karaveliogullari	
	Astracantha strictispina (Boiss.) Podl.	Convolvulus pulvinatus Sa'ad	
	Convolvulus pulvinatus Sa'ad	Cousinia iconica HubMor.	
	Cousinia iconica HubMor.	Thymus leucostomus Hausskn. & Velen	
Ph	Dianthus cibrarius Clem.		
	Salvia tchihatcheffii (Fisch. & C.A.Mey.) Boiss.		As a
	Scabiosa pseudograminifolia HubMor.		achmi
	Scorzonera pygmaea subsp. nutans (Czeczott) D.F.Chamb.		the lov
	Thymus leucostomus Hausskn. & Velen		_
	Anthemis kotschyana Boiss. var. gypsicola H.Duman	Achillea ketenoglui H.Duman	total
Total Salt (%)	Convolvulus phrygius Bornm	Onobrychis paucijuga Bornm.	potass
	Thymus leucostomus Hausskn. & Velen	Astracantha strictispina (Boiss.) Podl.	_
	Anthemis kotschyana Boiss. var. gypsicola H.Duman	Convolvulus phrygius Bornm	the pla
	Convolvulus phrygius Bornm	Cousinia iconica HubMor.	
	Iris pumila subsp. attica (Boiss. & Heldr.) K.Richt.	Thymus leucostomus Hausskn. & Velen	
	Centaurea nivea (Bornm.) Wagenitz		
Organic	Cephalaria aytachii Göktürk & Sümbül		
substances (%)	Astracantha strictispina (Boiss.) Podl.		
(70)	Convolvulus pulvinatus Sa'ad		
	Cousinia iconica HubMor.		
	Salvia tchihatcheffii (Fisch. & C.A.Mey.) Boiss.		
	Thymus leucostomus Hausskn. & Velen		
	Cousinia iconica HubMor.	Aethionema dumanii Vural & Adigüzel	
	Thymus leucostomus Hausskn. & Velen	Convolvulus pulvinatus Sa'ad	
Lime (%)		Alkanna orientalis var. leucantha (Bornm.) HubMor.	
		Cousinia iconica HubMor.	
		Thymus leucostomus Hausskn. & Velen	
Phosphorus	Cousinia iconica HubMor.	Achillea gypsicola HubMor.	
	Thymus leucostomus Hausskn. & Velen	Cephalaria aytachii Göktürk & Sümbül	
(P2O5)		Thymus leucostomus Hausskn. & Velen	
Potassium	Cousinia iconica HubMor.	Achillea gypsicola HubMor.	
	Thymus leucostomus Hausskn. & Velen	Cephalaria aytachii Göktürk & Sümbül	
(K2O)		Thymus leucostomus Hausskn. & Velen	

As a result of the physical and cehmical analysis of soil samples, he lovest and the highest level of pH, otal salt, lime, phosphorus and cotassium have been determined in he plant species.

34

#### The IUCN (The International Union for Conservation of Nature,) Red List of Threatened Species

#### **EN** = **Endangered**: High risk of extinction in the wild.

- Achillea ketenoglui H.Duman
- > Alyssum niveum Dudley
- > Anthemis kotschyana Boiss. var. gypsicola H.Duman
- Scabiosa hololeuca Bornm.
- > Sideritis gulendamii H.Duman & Karaveliogullari
- Verbascum gypsicola Vural & Aydoğdu

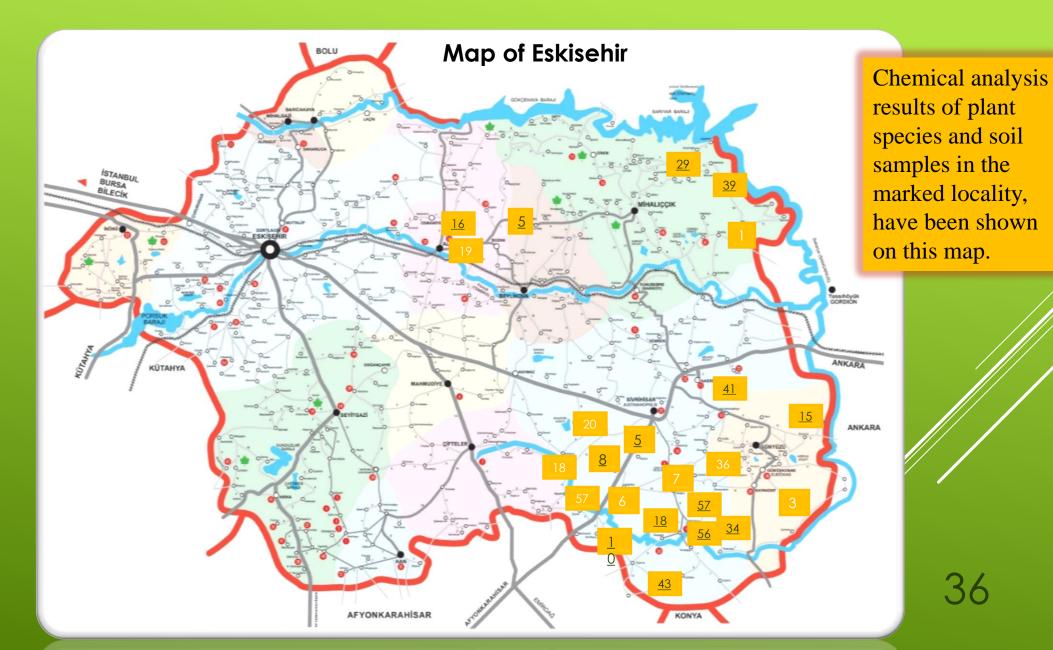
#### **VU** = **Vulnerable:** High risk of endangerment in the wild

- > Achillea gypsicola Hub.-Mor.
- Aethionema dumanii Vural & Adigüzel
- Astragalus kochakii Aytaç & H.Duman
- > Convolvulus phrygius Bornm.
- > Hesperis kotschyi Boiss.
- Iris pumila subsp. attica (Boiss. & Heldr.) K.Richt.
- Onobrychis paucijuga Bornm.
- Plantago crassifolia Forssk.
- > Thesium scabriflorum P.H.Davis

### **CR** = **Critically Endangered:** Extremely high risk of extinction in the wild

- > Centaurea nivea (Bornm.) Wagenitz
- Cephalaria aytachii Göktürk & Sümbül

- **NT = Near Threatened:** Likely to become endangered in the near future.
- Aethionema subulatum (Boiss. & Heldr.) Boiss.
- > Aethionema turcica H.Duman & Aytaç
- > Alkanna orientalis var. leucantha (Bornm.) Hub.-Mor.
- Astracantha strictispina (Boiss.) Podl.
- Astragalus macrocephalus subsp. finitimus (Bunge)
   D.F.Chamb.
- > Bupleurum turcicum Snogerup
- > Cirsium sintenisii Freyn
- Convolvulus pulvinatus Sa'ad
- Cousinia iconica Hub.-Mor.
- > Dianthus cibrarius Clem.
- Fritillaria fleischeriana Steud. & Hochst. ex Schult. & Schult.f.
- > Hesperis balansae E. Fourn.
- > Hyacinthella micrantha (Boiss.) Chouard
- Matthiola anchoniifolia Hub.-Mor.
- Ornithogalum alpigenum Stapf
- Paronychia dudleyi Chaudhri
- Salvia tchihatcheffii (Fisch. & C.A.Mey.) Boiss.
- Scabiosa pseudograminifolia Hub.-Mor.
- Scorzonera pygmaea subsp. nutans (Czeczott) Sideritis galatica Bornm.
- > Thlaspi jaubertii Hedge
- > Thymus leucostomus Hausskn. & Velen.



AKÜ FEBİD 12 (2012) 021001 (1-22)

#### Afyonkarahisar'daki Jipsli Topraklar ile Bitki Örtüsü İliskisi

Hasan Acar, Ahmet Serteser, Mustafa Kargioğlu Afyon Kocatepe Üniversitesi, Fen Edebiyat Fakültesi, Bİyoloji Bölümü, Afyonkarahisar nacaraku@gmail.com, aserteser@aku.edu.tr, kargi@aku.edu.ti

Gelis Tarihi:16.08.12: Kabul Tarihi: 06.03.13

Afronium him. Fee Bölgeri kuBatı Anadolı'da yer almakta olun Davir'ın erid ristemine göre hüzük bölümü B3 karesine girmektedir. Çalışma alanının büyük bölümünü kuvaterner arazi tipi kaplamaktadır. Çalışma alanı "Kurak - Yarı-kurak, Soğuk - Çok Soğuk Akdeniz biyoiklimine" sahiptir. Alanda "Doğu Akdeniz İkinci Tipi" yağış rejimi görülmektedir. Çalışma alarında Kahverengi, Alüvyal ve Kolüviyal Büyük Toprakları ile arazi tipi olarak Oplak Kayalar ve Molozlar bulunmaktadır. İran – Turan floristik bölgesi icerisindeki calısma alanından yaklasık 50 yaşküler bitki teshis edildi. Bu calısmada Afyonkarahisar'da ipsli Topraklar ile Bitki Örtüsü arasındaki ilişkisi incelendi. Bitki topluluklarının, topraklarla ilişkisini bulmak için toplanan toprak örneklerinin fiziksel ve kimyasal analizleri yapılarak yorumlandı.

#### The Relationships Between Gypsiferous Soils And Vegetation in Afvonkarahisar (Turkey)

#### Afyonkarahisar, being in Aegean / Middle- West Anatolian region, belongs to B3 square large part

according to the Davis grid system. Most of the work place is filled with quaternary type of land. The work place has "Arid-Semi Arid, Cold- Very Cold Mediterranean" bioclimate. Throughout the land "Eastern Mediterranean Second Type" antedecedent precipitation is observed. Throughout the work place, brown podzolic, alluvial and colluvial earth bare rocks and rubble stones are present as field type In the work place which is found in Irano-Turanian floristic region, nearly fifty vascular plants have bee identified. In this work, the relations between the gypsiferous soils and the vegetation is Afyonkarahisar have been investigated. In order to find the relationships between the soil and vegetation, soil samples have been gathered from the study area, and physical and chemical analysis of these samples have been carried out to interprete.

Afyonkarahisar, Ege Bölgesi İç-Batı Anadolu Bölümü sınırları icinde ver almaktadır. Büyük kesimi Ege Bölgesi'nin İç Batı Anadolu Bölümü içinde ver alan Afvonkarahisar ilinin, doğudaki kesimi İc Anadolu Bölgesi'nin, güneybatıdaki daha küçük kesimi ise Akdeniz Bölgesi'nin sınırları içinde yer aldığından dolayı Afyonkarahisar ili İç Anadolu ve Akdeniz Bölgeleri ile komsudur (Kargioğlu, 2001 ). Davis (1965-1985)'in grid sistemine göre, Afyonkarahisar' ın büyük bölümü B3 karesinde

Asia: Journal of Plantaciences 5 (4), 533-539, 2009 80 0006 Aging betweek for Scientific information

#### Synoptic View of the Steppe Vegetation of Central Anatolia (Turkey)

Kurt Latif, Tug G. Nillian and Reserve to Osman. Department of Diology, Loculty of Science, University of Ankara, Tendogan 08100 Ankara, Torkey

Abstracts Buckgainal and syntanomenical characteristics and the diagnostic a series of syntam described from Control American store regention were brought out in the descent study. All of the Control American stores communities belong to the Astropade-Free soles Class and the Conbeych do an ense-Thymic alia femosion. code, and its are suburders. Some I. fact details studies show that he status of the affirmer Agraculto arransiti Gypapy y ion e ioca yas solito has been represense, with thee small arross of the gypaneous

so 's y vastra. Lof Central Anatol a nac be exicosciland reconfirmed as a new order or suborder

Key words: Senecology, slepue vegetation, central Anatolia, Turkey

#### EXTRODUCTION

Turkey as one of the nebest and autorestines or intry. in the world in respect to its flow retin other resources. The notices of the nora of a country can be measured with a minute of plants and its converse attraction conve measured with respect to the distribution of plants and the diversity of weaptetion types. In both respects, Turkey is one of the most righest country in the world The reasons why Durkey's flore is rich and interesting can

- Lukey is situs ed where his port certs meet and
- where the migration rough plants passes for right Cornalabatical disensity (time different lapse of official as Commental, Versi leand Modificial assembly
- Longrap nel cise sity.
- Ceological and geomorphological civersity.
- Acres to behits, others to sea, falle and tiveilludari seriation from sea level to 3000 m.
- It's location at irrerazione po its of three phylogeographics regions (Eiro-Siberion, Irano-

botween west and one and its receipt at the state

As a result of hear caseing, the pare approximately. Study area. The sleppe regention covering 5000 Descring chains and various regentation by as an approximately sill of the Central Aristohia formany takes this shought has here are 11000 forening controlling from Here mountains at north to Terror lants in E., rocan continent it can be said hat Turkey exhibites a continental characteristic Biagonale (Spors environs to least,

Temperator. Co America, Tracey | Tel: +90 312 1225 (20/1089 | Fex: +90 312 2232345)

Others the more important severation type of funkey is steppe which spreads particularly at Central Anatolic and extending lawards part and poully east. Suato sailt also ecoupies high altitudes of Black sea and Textus

In the present study, the syntaconomic analysis of steppe formations of Centra, Anatolic have been pairied out. Central Anatolian among developed as the reside to destruction of primary forest vegetation by Diodic Repus (Dah, 1930, Akmar, 1974, Kilms, 1936 Avtua, 1907, 1970; incooch and Pelawan, 1987). The please vegetation which is permoentally definited by woody regetation of the Austelian servicery has been excluited as ten exactable housed environmental increase agreement activities, as in the mest of the

Althoreh Central Anatolian stepte Gows a written physiogeomy, it sentations in a bour trees and a mass within it and hemosyphophy to grosses Bronne conventatue Bous, Pesmos valesiaco Schleicher es Gaudin, Kosloria cristala (L.) Pera, Rispa phytocopyrighted regions of the configuration of th Combrights corrotte (L.) Dervista,) a si dominari que to-

e ains at anu? and for Alben at west to Anatolian

AKU J. Sci. 12 (2012) 021001 (1-22)



II. UILUSAL AKDENIZ ORMAN VE CEVRE SEMPO "Akdeniz ormanlarının geleceği; Sürdürülebilir toplum ve çevre"

#### Bozan Cevresi (Eskişehir) Bozuk Orman ve Bozkır

Vejetasyonu Münevver ARSLAN<sup>1,\*</sup>, Neslihan ERDOĞAN<sup>2</sup>, M. Ümit BİNGÖL<sup>3</sup>, Nejat ÇELİK<sup>1</sup>

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Eskiphir-Alpa-Bozan gevresinde karaçam ormanlarının tahrip elilmesinden zonra 870-1100 metre yükseliler arınmda kalan bozul orman, çalı ve bozir adınlarının bitü örnüsinin belirlemek amayıtı ayıqılan baçığana 2011-2011 yilinmek veriseyazınının qılınının gelirin gelirlemi gönemlerin 377-2012 yılının belirlemi yalının gönemlerin yalının gönemlerin 2012 yılının gönemlerin 2012 yılının gönemlerin 872-2012 yılının gönemlerin belirlemi kişin gönemlerin adınlarının yalının yalının gönemlerin belirlemi kişin gönemlerin belirlemi yalının gönemlerin yalının gönemlerin belirlemi kişin gönemlerin belirlemi yalının gönemlerin yalının gönemlerin belirlemi yalının gönemlerin yalının yalının yalının gönemlerin belirlemi yalının gönemlerin yalının y

Anahtar Kolimolor Voietasson Rozuk Orman Rozur Rozan Süksesson

#### Degraded Forest and Steppe Vegetation in the Environs of Bozan (Eskişehir)

The early mining determination of the regardation over in the degraded over, Janua, and suppar seaso. between although of 507-1100 meters which exclusions in \$45 min; pain sevens in the implient 50 min. (Jahu, Edgalath) has been carried on in \$7 joint during optimal carringment periods of the regardation between 2011 and 2012. Sampling prices were determined to a minimal areas methods, while the vegetation was classified using firms. Stampest method, In grouping of anaphing plots, cluster analysis in FOOB programma was used and there paint progon were found to be present. In determination of indicator species within plant groups, indicator species analysis was applied. The vegetation of the study area was grouped into three as degraded forest, shrub and steppe. Degraded shrub and forest vegetation can be discerned by lacking of indicator species. Contrally, the steppe vegetation in which the anthropogenic effect is minimal can be identified by presence of the steppe vegetation indicator and the steppe vegetation indicator.

#### ANKARA ÜNİVERSİTESİ FEN BİLİMLERİ ENSTİTÜSÜ

#### DOKTORA TEZİ

SÍVRÍHÍSAR DAČLARI'NIN (ESKÍSEHÍR) RÍTKÍ EKOLOJÍSÍ VERÍTKÍ SOSYOLOJÍSÍ YÖNÜNDEN ARAŞTIRILMASI

NESLİHAN ARSLANTÜRK

BİYOLOJİ ANABİLİM DALI

ANKARA 2007

Her hakkı saklıdır



BIODICON www.biodicon.com ISSN 1308-5301 Print; ISSN 1308-8084 Online Biological Diversity and Conservation Biyolojik Çeşitlilik ve Korum

quadrat pairs

#### Kürsad ÖZKAN

S.D.Ü. Orman Fakültesi, Orman Fakültesi, Toprak İlmi ve Ekoloji Anabilimdalı, 32260, Çünür/ISPARTA

It can not be possible to investigate relationships between vegetation and site species by using statical analysis with datum belonging to only a few of quadrats However, It can be possible to incease datum number and perform statistical analysis by means of similarity values between quadrat pairs.

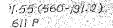
In this study. It was purposed to evaluate to relationships between vegetation and site properties accordance with similarity values between quatrat pairs. Data was collected from 9 quadrats between Belceğiz and Eşek field and, 8 quatrats between Üçtepeler and Aliefendi plateaus for this study.

It was used correlation analysis to determinate relationships between vegetation and altitude in Belcežiz-Esel field site. It was also used t-test to determinate relationships between vegetation and aspect in Úçtepeler-Aliefendi plateaus site. It was found that altitude in Relceğiz-Rsek field site and aspect in Úctepeler-Aliefendi plateaus site are statistically significant. The results was showed that altitude in belceřiz-Esek field site and aspect in Úctepeler Aliefendi plateaus site must be taken into consideration factors for forest site classification and mapping.

Keywords: Vegetation-Environmen,t Relationships, Forest site, Altitude, Aspect

Bitki örtüsü ile vetisme ortamı özellikleri arasındaki iliskilerin örnek alan benzerlik değerlerine gör değerlendirmesi

Bitki örtüsü ile vetisme ortamı özellikleri arasındaki iliskilerin arastırılmasında örnek alan savısının az olması durumunda istatistiksel yöntemlerin kullanılması mümkün olmayabilir. Ancak örnek alan ciftleri arasındaki benzerlik değerleri sayesinde veri sayısı arttırılabilir ve istatistiksel analiz yapılabilir





TÜBİTAK TBAG. Proje No. 630

ANKARA, POLATII, HAYMANA VE ESKISERIR BOLAYLARINDAKI STEP VLJETASYOMUNUN SITKU SOSYGLDJISI YÖNÜNDEN ARASTIRILMASI

Fruf . Dr . V . Almar Prof. Dr. P. Oudzel Dog. Dr. O. Keleanglu Ar . Gör . M . Demirius

A. U. Pan Fubülten! Błycieji Böjimű ANKARA - 1985

TÜRZİYE BILLINGER, VENERNIE ARASEINIA ELEKUMU EUTCPHANESA



#### Bitki Örtüsü ve Yetişme Ortamı İlişkilerinin Yorumlanmasında Atama ve Sınıflandırma Yöntemlerinin Kullanımı: Cukurova Deltaları Örneği

Yüksel ÜNLÜKAPLAN, Kemal Tuluhan YILMAZ

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Ozer. Bu çalışmada biyolojik ve fiziksel çevreye ait verilerin iliş bilendirilmesinde çok değişkenli istatistiksel analiz eknilklerinin (CDIAT) kullandmazı ve bu yolla ÇDİ yöntemlerinin ekolojik çalıymalarla bütünleşirilmesi hedellemiğir. Bu amaçlı, argıtırma alanı olarak seçilen ve Çukurova Debalan şekinde adınadınla hay alanındaki veşlerayonları temzi den titler ve önnek alanlar henre ilkeline göre enrilmdamlıştır. Bu kapsamda sınıflama yöntemi olan kitmeleme analiri PC-ORD 4.10 yazılımı kullanılmıştır. Vejetasyon analizi kayıtlarında yer alan 85 örnek alan ruderal ve doğala yakın alanlar olmak üzere 2 ana grupta oplanmytr. Ruderal alanlar kendi içinde aynı bir grup oluştururlen, doğalı yalon alanlar ise 4 alt grupta oplanmıştır. Örrek alanlardar elde edilen 181 bitki takonunun dağılmını görmek amucıyla uygulanar klimelene asılılındı ise tür çeşiliğişini fatal olunan nedeniyle 2 ana grup alandı 4 lak grup oluşulga görülmüştüt. Deltadaki örnek alanların ve türlerin biyotop üpi, sür sayos, toplam örtülülük, deninden Stellindgut: Deladali ömek aladaru ve tikrini biyotop fij, ili syya, tspan orrahans, urma-yilledik we egim gik cepred digidanekrine ne olgale edilerdigin oraya kuyata sanaya sana mendaranda Kanorik Uyun Anaizi (KUA), MSPS 3.331 yaziam ile ugudamngur. Qalquada beg çevred digilenden biyotop içi ve toplam örtülülüğin alan ver palarının dugum nala en önemli ki adala dalada sana dalada sanaya sa gevretel değiğlen olduğu, bunakarın eğimin nişsi öneminin düşük ödeğiş tonunan sarılmıştır. Anahtar Relimeler: Atama, ayırma, gok değişlenli istatistikel analız eknilderi, Çukurova deltaları, kanonli uyun analiz, kimelem saalızi.

#### Using Ordination and Classification Methods to Interpret Vegetation and Habitat Relations The Cukurova Deltas Case

The Cultures Deltas Case

This conjugates products to associate biological and physical environment, thus
lands using using multivariate statistical technics with enological studies have been support. To this end, species
integrating multivariate statistical technics with enological studies have been support. To this end, species
which represent the superstancial most almost enclosed as the subsequence Deltas', and
sample areas have been classified with respect to their is simulation. In this context, dustered analysis as a
destruction ended have no conducted with the PC. COD. 20. 18. Gas supple areas which cody has in the
law formed a distinct group in destructives while semi-natural areas have suggraped to 4 sub-groups
(clauser). The resulted of the clauser analysis to solven the distribution of \$110 plants tones anquired from
the sample areas indicate. He study groups under 2 main groups.

The cannoid correspondence analysis has been omducted with MYSF 3.31 to put inward the magnitude of the relationship between usuple area, special and environmental variables like belongs upon, number of species, read covertness, else aton and stope. In this musi, it has been reached that biotype type and total important considering area and specie forming.

Keywords: Cannoil correspondence analysis, classification, cluster analysis, Cukurova delax, multivariate attacking analysis tochics, Confusion,

Ünlükaplan Y, Yılmaz KT (2009) Birki Örtüsü ve Yetişme Ortamı İliş kilerinin Yorumlanmasında Atama ve Sınıflandırma Yöntemlerinin Kullanımı: Cukurova Deltaları Örneği. Ekoloji 19, 73, 10-20.

FEN BİLİMLERİ ENSTİTÜSÜ DERGİS

Kompozisyonu Üzerine Bir Araştırma

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alanındaki vejetasyon tiplerine özgü taksonlar verilmiştir.

the research area, are given.

Sivrihisar Dağları (Eskisehir/Türkiye) Vejetasyon Tiplerinin Floristik

Mehmet Akif Ersoy Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, Burdur <sup>9</sup>Ankara Üniversitesi, Fen Fakültesi, Biyoloji Bölümü, Ankara <sup>3</sup>Çevre ve Orman Bakanlığı, ARGE Dairesi Başkanlığı, Orman Toprak ve Ekoloji Araştırmaları

Neslihan ERDOĞAN<sup>1\*</sup>, Osman KETENOĞLU<sup>2</sup>, M. Ümit BİNGÖL<sup>2</sup>, Fatmagül GEVEN<sup>2</sup> v

Özet: Bu çalışmada, Sivrihisar Dağları (Sivrihisar/Eskişehir)'nın vejetasyon tiplerini floristik kompozisyonu araştırılmıştır. Bölge vejetasyonunu tespit etmek amacıyla Mart 2003

Eylül 2005 yılları arasında, bitkilerin vejetasyon dönemleri süresince gerçekleştirilen araz

calısmalarında toplam 1100 bitki örneği toplanmıştır. Bu örneklerin değerlendirilmesi sonuci

49 familyaya ait 184 cins ve 337 takson tespit edilmistir. Bu calısmada sadece arastırmı

Anahtar Kelimeler: Sivrihisar Dağları, B3, Eskişehir, Vejetasyon Tipleri, Floristi

A Research on the Floristic Composition of the Vegetation Types of Sivrihisar Mountains

Abstract: In this study, the floristic composition of the vegetation types of Sivrihisa Mountains (Sivrihisar/Eskisehir) were investigated. In order to determine the vegetation o

region, a total of 1100 plant specimens collected in the vegetation period between Marc

2003-September 2005. As a result of evaluating these samples, 184 genera and 337 taxa tha

belonging to 49 family have been identified. In this study, taxa, specific to vegetation types o

Araştırma Alanı olarak seçilen Sivrihisar Dağları; İç Anadolu Bölgesi'nin KB (kuzeybatı

kesiminde yer almaktadır. Sivrihisar D.; Eskişehir ilinin GD (güneydoğu) köşesinde, Sakary

yayının içinden başlayarak, GD-KB yönünde Kaymaz Bucağı'na kadar uzanmakta olup, eşil

görünüşlü bir yayla üzerinde 390 28' 00 kuzey enlemi ile 310 34' 60 doğu boylamında yer alır

Keywords: Sivrihisar Mountains, B3, Eskisehir, Vegetation Types, Floristic Composition

değerlendirilmesi kaçınılmazdır. Ekoloük calısın Ekosistem analizlerinde çok sayıda değişken söz çevresel ya'da biyolojik, diğerdeğişkenlerindur konusu olduğundan, çalışmalarda güvenilir ve hakkında bilgiler verirken birden fazla biyo geçerli sonuçların elde edilmesi için bu değişkenliği verinin tepkisine yönelik tahminleri gerektiri stan tüm faktörlerin dikkate almması, elde edilen tedir. Bu nedenle çok değişkenli istatistiksel a verilerin ve değişkenlerin bütün yönleri ile teknikleri (CDİAT), tanımlama ve hipotez testb

Gelis: 06.05.2009 / Kabul: 16.09

MAKUFEE



#### İç Anadolu'dan (Polatlı-Haymana) Astragalo karamasici-Gypsophilion eriocalycis Alyansı İçin Yeni Sintaksonlar

Fatmagül Geven¹\*, Osman Ketenoğlu¹, Ümit Bingöl¹, Kerim Güney²

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Ozec.
Bi çalşımada, Polatlı-Haymana arasında kalan bölgenin step vejetanyonu incelenmiştir. Araştırma alanı İç Anadolu Bölgesinin Güney Bas kesiminde yer almaktadır. Jipdi ve mamlı-jipdi toprakların yaygın olduğu yınlarınk alır, Gok söğük Akdeniir İklimi'nin etkisi altında olan bu bölgede vejetayon Brazın-Binquet procedure days it phoyetts polar ordinasyon shift ill anni fedireck iti yen il shet birlijë in numlanma ye sintakonomik olarak smflandenlmgar. Ilk kez tanmlanan birliker Uluslarana Bitki Sosyolojisi Adlandma Kodu' kuzilamna sugun olarak adandrimingtor. Birikiker ve ai olduklar itus tirimine aggidaki gibidir: Sıruf: Astrugulo-Brometea Quezel 1973

Nati Anggio-Dominat Queen 19/3
Order Ondophida memic-Thymetical leucation i Alman, Ketenoglu, Queen 1985
Alyan: Anogdo kurmunisi-Opophidian onkochdu Ketenoglu, Queend, Alman, Aydogdu 1983
Brills: Kahn-Anggioleum mienephid as n. nova
Brills: Kimarini-Angulolium mienephid as n. nova
Brills: Kimarini-Angulolium mienephid se n. nova
Brills: Kimarini-Angulolium mienephid se fostologi Qiyapu benzer bir liklerie bayaslanarak tartuplungtar.

Anahtar Kelimeler: Haymana, ordinasyon, Polatli, sintaksonomi, step vejetasyon

#### New Syntaxa for Alliance Astragalo karamasici-Gypsophilion from Central Anatolia (Polath

In this study, the steppe vegetation between Polath-Haymana had been analyzed. The study area is located in the southwest part of Central Anatolia covered with the gepaceous and marhy-psycacous soils. The vegetation which is under the efficience control of semi arid very oald spee of Mediter amean climate was analyzed by the three dimensional ordination technique based on the Braum-Blanquet method. Two new associations were described and classified syntaxonomically. These associations which are defined for the first time are named according to the rules of "International Code of Phytosociological Nomenclature". Associations and their higher units are as follows:

Accounters and their agreet units are as to stoke.

Class: At again-Dementa Quazed Playmantom Akman, Keennglu, Quazed 1985

Order: Onderpchild amoni-Thymeatilia leusantom Akman, Keennglu, Quazed 1985

Alianca: At angalo kanamakir-Qyapyhillian eriordydri Yetenoglu, Quazed, Akman, Aydogdu 1983

Accociation: Salvisi-Airagedeium miorxorphali ass. nova

Association: Minuartio-Agantholimetum acerosi ass. nova Phytosociological and phytoecological features of these associations had been discussed and compared with

Keywords: Haymana , ordination, Polati, steppe vesetation, syntax

Geven F, Keteroğlu O, Bingöl U, Güney K (2009) İç Anadolu'dan (Polath-Haymanı) Astraçalı kuramasici-Oysuqhillisı erisculyci Alyanın İçin Yeni Sintaksonlar. Ekoloji 18, 71, 32-48.

#### GİRİŞ Mazzetti (1909) tarafından başlatılmış olup;

Türkiye'de vejetasyon çalışmaları geçmişte batısında Czeczott (1938) ve Schwarz (1936), orta olduğu gibi bugün de yerli ve yabancı birçok Anadolu da ise Krause (1940) gibi yabanc araştırmacı tarafından sürdürülmektedir. Bu araştırmacılar tarafından sürdürülmüştür. İç calismalar Anadolu'nun kuzev doğusunda Handel- Anadolu'nun flora ve vejetasvonu ile ilgili calismala

Gelis: 27.04.2007 / Kabul: 08.09.2008

No: 71, 200

#### ANKARA ÜNİVERSİTESİ FEN BİLİMLERİ ENSTİTÜSÜ

VÜKSEK LİSANS TEZİ

BAZI JİPSOFİL VE JİPSOVAG TÜRLERİN JİPS STRESİNE UYUM STRATEJÍLERÍ ÜZERÍNE BÍR ARASTIRMA

Ayşenur KAYABAŞ

BİYOLOJİ ANABİLİM DALI

ANKARA

Her hakkı saklıdır

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I would like to thanks
Professor Doctor Atila Ocak,
Professor Doctor Latif Kurt,
Research Assistant Doctor Okan Sezer
Research Assistant Doctor Ebru Özdeniz
for his support in the study.

# Thanks You for Listening