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PRODUCTIVITY AND NUTRITIVE VALUE OF SOME ASSOCIATIONS AT WADI EL NATRON–EL ALMEEN ROAD IN THE NORTH WESTERN COAST

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ABSTRACT

Seasonal variations in climatic factors have a great effect on growth parameters of most plant species. The importance of the recent investigation is to evaluate the grazing value and availability of development the desirable plants for feeding livestock around the year and its relationship with climatic factors. Therefore, this study was carried out in 1998/1999 – 1999/2000 to make survey to the plant vegetation at wadi El Natron – El Almeen road (East Marsa Matrouh) at 5 sites in that area. every wet and dry season to evaluate the vegetation structure throughout 25 chart quadrates (5*5m^2 each) . Correlation coefficient between some climatic factors (rainfall, temperature, and evaporation) and each of the different vegetation parameters within each of the vegetation types was calculated.

The results showed that most of the pasture measurements such as coverage %, Frequency %, Abundance %, fresh and dry production (Ton/fed.) reached their maximum during dry seasons except plant density (plant/m^2) was greater in wet seasons. The results indicated that fifteen species belonging to eleven families were found. The majority of these species were perennial plants. *Anabasis articulate* and *Thymelaea hirsuta* were highest dominnet comparing the other plants to its adaptability to dry conditions.

Generally, positive correlation between rainfall and each of annual palatable species was found, adversely, temperature take an opposite trend, incase of unpalatable and perennial species, each of the climatic factors had variable effect on each of the vegetation measurements.

INTRODUCTION

Natural vegetation acts in most countries of the world as a main resource for supporting wild and domestic animals with its needs of forage. The north western coast (N.W.C.) of Egypt is deliberated the richest district in annual winter rainfall (150 mm). Different plant associations and species appeared specific environmental needs, as climatic or edaphic, Abou-Deya (1984) ، Abou-Deya (1990 a/b).

However, the aim of the present study to evaluate the seasonal changes in natural vegetation at different sites to find out the relationship between the vegetation parameters and some climatic factors during wet and dry seasons as well as the changes of chemical content of some vegetation plants according to edaphic factors, Hence, improving these sites for suitable grazing. Rios and Rios and Riley (1985) concluded that yield and chemical content varied according to the growth season.

MATERIALS AND METHODS

Five sites at wadi El Natorn – El Almeen road (164 Km Cairo-Alexandria desert road) were chosen to carry out the present investigation in 1998-1999 and 1999-2000. The different sites are located at 34, 40, 95, 110 and 120Km from the beginning of the road, respectively. Twenty five chart quadrates of 5m^2 method

were used to determine the abundance, density, frequency and cover of the natural vegetation two times around the year, wet season (winter and spring months) and dry one (summer and autumn months) within each site. Number of individual species and the area occupied by them were determined from twenty five stand sampling over the five sites every wet and dry seasons and were used to evaluate the average measurements according to the method out lined by Hanson and Churchill (1965)., and Mucller -Dombois and Ellemberg (1974) as the following

$$\text{Abundance \%} = \frac{\text{Number of the individual species}}{\text{Total number of the whole species}} \times 100$$

$$\text{Density \%} = \frac{\text{Number of the individual species}}{\text{Total area (in units)}} \times 100$$

$$\text{Frequency \%} = \frac{\text{Number of occurrence of the individual species}}{\text{Number of occurrence of the whole species}} \times 100$$

$$\text{Cover \%} = \frac{\text{The area occupied by the species}}{\text{The whole investigated area (in units)}} \times 100$$

In each quadrate all the above -ground phytomass of all species were harvested and weighted in the field (fresh weight),oven dried at 70 ^{o} C for a constant weight (dry weight)during the tow seasons.

The plant species were identified and divided into groups palatable, unpalatable, grasses, annual and perennial species (Aslan, 1959). Chemical composition in fresh and dry prouduction of each plant species were determined as following:

Ttotal nitrogen was determined by modified microkjeldahl method according to peach and Tracy (1956) and multiplied by 6.25 to determined crude protein, crude fibre and total ash were determined according to A.O.A.C. (1970), ether extract was extracted by Hexane in Soxhelt according to A.O.A.C. (1970). Sodium and potassium contents were determined by flamephotometercaly according to Johanson and Ulrich (1959). Total digistable nutrient (TDN) was determined according to Khafagi (1977), soil samples were taken from the different sites from two depths, i.e. (0-20) and (20-40). Mechanical and chemical analysis of soil were conducted Table (1 and 2). Simple correlation between the average seasonal temperature, rainfall, and evaporation (Table 3) and vegetation measurements for the previous plant groups were calculated.

Table (1):Physical propraties of soil of five sites in Wadi El- Natron- El Almeen road.

Sites	Depth	Gravel	Fine Gravel	Coarse Sand	Medium Sand	Fine Sand	Very fine Sand	Silt & clay	Texture Class
1	0-20	0.151	15.933	18.024	18.856	24.973	4.533	17.530	Sandy

	20-40	0.184	20.454	16.259	25.567	23.216	4.194	10.126	Sandy – Gravel
2	0-20	-	7.513	31.067	22.938	21.084	4.833	12.565	Sandy – Gravel
	20-40		5.690	21.379	23.339	23.202	6.351	20.039	Sandy
3	0-20	-	0.282	20.759	30.654	30.909	4.121	13.278	Sandy coarse
	20-40		0.287	18.766	30.144	31.143	4.566	15.094	Sandy coarse
4	0-20	-	0.650	15.908	38.624	28.859	3.932	12.027	Sandy coarse
	20-40		0.322	12.494	39.858	29.406	4.418	13.502	Sandy Silty
5	0-20	-	0.328	7.907	33.833	42.651	4.975	10.306	Sandy
	20-40		0.241	5.862	30.168	42.697	6.081	14.951	Sandy

Table (2):Soil chemical propertiesof five sites in Wadi El- Natron- El Almeen road.

Sites	Depth	pH	Ec Mmhos /cm	Cations (me/L)				Anion (me/L)			
				Na+	K+	Mg++	Ca++	Co3-	HCO3-	Cl-	SO4-
1	0-20	7.59	2.51	1.74	0.58	5.1	17.68	-	4.7	18.0	2.4
	20-40	7.47	2.83	3.0	0.74	6.56	18.0	-	5.3	20.0	3.0
2	0-20	7.85	0.16	0.28	0.22	0.4	0.7	-	0.9	0.6	0.1
	20-40	7.90	0.23	0.37	0.29	0.5	1.14	-	1.06	1.14	0.1
3	0-20	7.66	0.27	0.46	0.31	0.93	1.0	-	0.98	1.52	0.2
	20-40	7.77	0.22	0.32	0.38	0.5	1.0	-	1.05	1.03	0.12
4	0-20	7.69	0.22	0.31	0.38	0.4	1.11	-	1.02	1.0	0.18
	20-40	7.90	0.36	0.31	0.20	0.3	1.3	-	1.10	1.6	0.18
5	0-20	8.04	0.18	0.30	0.3	0.3	0.9	-	1.0	0.70	0.1
	20-40	7.84	0.23	0.35	0.33	0.5	1.12	-	1.09	1.11	0.1

Table (3):Means of some of the meteorological data in Wadi –El Natron- El Almeen road during the period extended from Winter1999 to Autumn 2000 season.

Months	Climatic Factors					
	Temperature (C)		Rainfall (mm)		Evaporation (mm)	
	Wadi El Natron	El Almeen	Wadi El Natron	El Almeen	Wadi El Natron	El Almeen
January	13.3	12.6	3.5	2.9	5.8	5.7
February	14.2	13.3	2.7	4.4	7.0	6.06
March	16.4	14.7	3.0	4.4	8.02	6.5
April	20.2	17.5	0.76	0.97	11.2	7.3
May	23.2	19.5	0.3	0.21	12.7	6.41
June	26.0	23.3	0.0	0.12	13.4	7.2
July	27.2	25.09	0.1	0.0	12.3	7.8
August	27.2	25.5	0.0	0.0	11.4	7.4
September	25.08	24.2	0.0	0.0	10.3	6.5
October	22.4	21.8	0.08	1.51	7.11	5.08
November	18.6	17.8	2.6	3.5	6.2	5.6
December	14.5	14.2	3.3	4.9	4.7	5.6

RESULTS AND DISCUSSION

1. Botanical composition:

Data presented in Table (4) appear that eleven families of 15 species were found under five different sites at Wadi El-Natron El Almeen road throughout both wet and dry seasons. The highest plant number was noticed in dry season at

site three followed by site four and five. *Anabasis articulata* and *Thymelaea hirsuta* were the highest dominant plants compared with other plants may be due to its adaptability to dry and salt conditions. Similar results were discussed by Ayyad and Ghabbour (1977) which they reported that existing environmental conditions have an important role in flourishing, productivity and nutritive values.

2. Vegetation Analysis:

Plant species were grouped into perennials and annuals and the different vegetation measurements (Abundance, density, frequency and cover) were estimated to every wet and dry season around the year.

a) Density:

Data in table (5) indicate that native stands show higher density in wet season in the site 2 (6.5 plant/m^2) and followed by site 4 (5.2 plant/m^2) while the greatest number in dry season were found in site 4 followed by site 5 (3 plant/m^2). This in turn annual and permit seeds start to germinate slowly at winter season and then increased gradually till spring, obviously, density reached the minimum in dry season (Summer and Autumn) due to the absence of annuals. Ibrahim, (1995) found that the superior association in plant density were *Hammada* in spring, *Hammada* and *Artemisia* in Winter.

b) Cover:

Results in table (5) indicate that site 5 had the highest coverage percentage in dry season (54.5%) followed by site 1 in wet season (48.3%). Also, data show that *Anabasis* and *Thymelaea* plants exerted higher response in total coverage. It may be attributed to little role of annuals in augmenting plant coverage, but perennial herbs had the majority in coverage percentage. In this respect, Ibrahim (1995) found that the greatest coverage mean was measured in *thymelaea* association in spring, autumn and winter in Sidi Barrani.

c) Frequency and Abundance:

Table (6) showed that frequency of plant species in Site (4) surpassed in wet and dry seasons other sites, in addition *Anabasis* and *Thymelaea* were higher in frequency and abundance during the whole year (wet and dry)seasons. This could be due mainly to the effect of edaphic factors which act as promoter for the richest and most adaptive to the dominant environment conditions, Abd-Alla, (1999) reported that frequency of the plant species in El-Qaser area was higher than that in El-Negila during the three seasons of winter, spring and autumn and vice-versa in summer of the first year.

d) Fresh and dry productivity:

Fresh foliage yields of native plants are presented in Table (7), results appear that sites 5 and 1 produced superior yields of 6.76, 5.86 Ton/fed respectively during wet season, while site 4 was the highest productive one appeared during dry season. This indicated that production of those sites was correlated much by availability of rains as well as the other climatic factors such as mean temperature which considered as suitable for most of the plant species found in that area as well as the humidity during summer season.

Also, Table (7) show that dry foliage yield in Site (4) produced the greatest dry yield (4.83 Ton/fed) during the dry season. Addationally, *Anabasis* and *Thymelaea* plants were produced higher fresh and dry weight and this may be due

to their growth habit, whereas they characterised as woody branched herb. Ibrahim (1995) noticed that *Thymelaea* association exerted highest fresh yields in spring, autumn and winter.

3. Chemical composition:

Data in Table (8) indicate the chemical constituents of different species under study at different sites in wet and dry season.

It was noticed that *Anabasis articulata* was found in all sites, this may be to its wide adaptability to drought and salinity while, *Arthrocnemom glaucum* was found only at site 4 and 5, this may be to this sites are narrowest from sea share.

No clear trend about different chemical content for different sites except the high content of sodium for *Arthrocnemon glaucum* at site 5 followed by *Anabasis articulata* at site 4 and 3, while CP content was higher in *Zilla spinosa* at site 2 followed by *Asphodelus microcerpus, Lycium europeum, Thymelaea hirsuta* and *Anabasis articulata* in order, this trend was observed in all sites tested.

Fibre content was higher in *Zilla spinosa, Artimisia inculta, pituranthos tortuosus, carduncellus eriocephalus* and *Lycium europeum,* the high content of crude fibre may be attributed to their prennial habit which have more woody branches.

Ash content was higher for *Anabasis articulata* followed by *arthocenemon glaucum* and *Carduncllus eriocephalus*.

TDN values were higher in *Zilla spinosa* followed by *Pituranthos tortuosus, Gymnocarpos decandrum* and *Artemisia inculta* compared with other species.

No clear trend for the rest of chemical contents in wet and dry season was found.

4. Correlation coefficient:

Correlation coefficient between each of the seasonal climatic factors and different vegetation measurements was estimated and presented in Table (9). Data indicate that the cover, frequency, fresh and dry productivity correlated positively with temperature and evaporation while the rate of rainfall was correlated positively with density and frequency only.

It may be attributed to increase number of annuals as raising rate of rainfall which tended to increase density, and frequency, but the canopy of the plants was still in small size leading to a decline in cover percentages, these results are in harmony those obtained by Abou- Deya (1990b).This means that increasing temperature and evaporation led to disappear grasses and annuals which correlated positively with precipitation.

Table (9): The correlation coefficients between some seasonal climatic factors and vegetation measurements at Wadi El Natron- El Almeen road.

Vegetation Measurements	Climatic factors		
	Temperature	Rainfall	evaporation

Density	*	**	*
Cover	**	*	**
Frequency	**	**	**
Fresh yield	**	*	**
Dry yield	**	*	**

***and** : Mean non-significance and significance, respectively.**

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الإنتاجية والقيمة الغذائية لبعض العشائر بطريق وادى النطرون العلمين بالساحل الشمالى الغربى

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وحدة المراعى – مركز بحوث الصحراء القاهرة

يختلف التركيب الغطائى الخضرى الطبيعى باختلاف فصول السنة لذلك اجريت هذه الدراسة فى خمسة مواقع مختلفة من بداية طريق (وادى النطرون – العلمين) عند الكيلو ٣٤، ٤٠، ٩٥، ١١٠، ١٢٠ فى كلا من موسمى الجفاف والأمطار لعامى (١٩٩٨-١٩٩٩ و١٩٩٩-٢٠٠٠) بغرض دراسة تركيب وخواص الغطاء الخضرى فى كل موسم ومحتوى التربة وذلك باستخدام طريقة القطع المربعه(٥ x ٥ م^{٢}) وقد تم حساب متوسطات الكثافة، الوفرة- التكرار والتغطية من خلال الخمس مواقع فى كل موسم.

ثم قسمت النباتات بعد تعريفها إلى مجاميع هى النباتات المستساغة وغير المستساغة والحولية والمعمرة. ثم حساب معامل الارتباط البسيط بين كل من درجات الحرارة – معدل الأمطار – ومعدل البخر الموسمية وبين كل من قياسات النمو الخضرى فى داخل كل مجموعة نباتية وقد دلت النتائج على أن معظم القياسات الخضرية للتغطية والوفرة والتكرار والمحتوى الخضرى الناتج وصلت إلى اعلى انتاجية لها فى موسم الجفاف بينما الكثافة النباتية كانت اعلى فى الموسم الرطب. واحتوت المنطقة على خمسة عشر نوعا نباتيا تتبع احدى عشر عائلة نباتية والأغلبية للنباتات المعمرة للعجرم والمتنان حيث كانت لهما السيادة لتأقلمهم للجفاف كان هناك ارتباط موجب بين كمية الامطار وبعض الصفات المحسوبة للنباتات المستساغة والحولية على عكس الحال مع درجة الحرارة ومعدل البخر التى ترتبط ارتباط موجب بمعظم الصفات بالنباتات الغير مستساغة والمعمرة.

able (4): Effect of location and growth season on the species recorded in Wadi El- Natron El Almeen district during 1999-2000 seasons.

No.	Family name	Scientific name	Arabic name	platability	Duration	Wet Season					Dry season				
						S1	S2	S3	S4	S5	S1	S2	S3	S4	S5
1	Gramineae	Schismus barbatus	Abu- hereiba	P	An		+								
2	Compositae	Artemisia inculta	El- Sheeh	P	Pr								+		+
3	Compositae	Carduncellus eriocephalus	kharshoof	P	Pr							+			+
4	Cruciferae	Zilla spinosa	Zill	up	An							+	+	+	+
5	Chenopodiaceae	Anabasis articulata	Agram	up	Pr	+	+	+	+	+	+	+	+	+	+
6	Chenopodiaceae	Arthrocnemon glaucum	Hatab arad	up	Pr					+					+
7	Caryophyllaceae	Gymonocarpos decandrum	Garad	p	Pr			+					+		
8	Thylmelaeas	Thymelaea hirsuta	Methenan	up	Pr	+	+		+	+		+	+	+	+
9	Alliaceae	Allium desertorum	Basel El- Hanasa	p	Pr			+							
10	Umbelliferae	Pituranthos tortuosus	Shabat El- Gabal	p	Pr			+					+	+	
11	Liliaceae	Asparagus aphyllus	Aqool gabal	p	Pr									+	
12	Liliaceae	Asphodelus microcarpus	Basel El- Konsal	up	Pr			+						+	
13	Solanaceae	Lycium europeum	Awezaig	up	Pr			+							
14	Solanaceae	Hyoscyamus muticus	Sakaraan	up	Pr				+						
15	Polygonaceae	Polygonum eqisetiforme	Qradaab	p	An							+			
		No. of plants				2	3	4	4	4	1	4	7	6	6

An= Annual ; Pr = Perennial up = unpalatable P= Palatable.

Table (5): Effect of location and growth season on the density (plant/m2) and coverage percentage of native plants grown in Wadi El- Natron El Almeen distrcit during 1999-2000 seasons.

No. of plant species	Density (plant/m2)												Coverage %											
	Wet season					Total	Dry Season					Total	Wet season					Mean	Dry Season					Mean
	S1	S2	S3	S4	S5	Wet	S1	S2	S3	S4	S5	Dry	S1	S2	S3	S4	S5	Wet	S1	S2	S3	S4	S5	Dry
1		5				5																		
2		0.2				0.2			0.2		1.6	1.8		0.78				0.2			3.5		9.5	2.6

3								0.2			0.2	0.4								2.5			2.5	1.0
4		0.3				0.3		0.1	0.1	0.3	0.1	0.6		0.67				0.1		3	2	6.5	1.5	2.6
5	0.9	0.1	0.2	0.4	0.4	2	1.1	0.5	0.4	0.5	0.3	2.8	41	1.5	1.0	2	11	11.3	53	22	6	11	10	20.4
6					0.2	0.2					0.5	0.5					10	2					13	2.6
7			0.6			0.6			0.1			0.1			3			0.6			3			0.6
8	0.1	0.9		0.8	0.2	2		0.3	0.4	0.5	0.3	1.5	7	28.5		18	14	13.5		17	20.5	26.5	18	16.4
9			2			2									1			0.2						
10			0.2			0.2			0.2	0.1		0.3			2			0.4			2	1		0.6
11										0.1		0.1										1		0.2
12				3.8		3.8				1.5		1.5				5		1				3		0.6
13	0.1			0.2		0.3							0.3			3		0.6						
14					0.2	0.2											8	1.6						
15									0.1			0.1									1.5			0.3
Total	1.1	6.5	3	5.2	1	16.8	1.1	1.1	1.5	3.0	3.0	9.7	48.3	31.83	7	28	43	31.5	53	44.5	38.5	49	54.5	47.9

Table (6): Effect of location and growth season on the frequency and abundance percentage of native plants grown in Wadi El- Natron El Almeen distrcit during 1999-2000 seasons.

No. of plant species	Frequency %												Abundance %											
	Wet season					Mean Wet	Dry Season					Mean Dry	Wet season					Mean Wet	Dry Season					Mean Dry
	S1	S2	S3	S4	S5		S1	S2	S3	S4	S5		S1	S2	S3	S4	S5		S1	S2	S3	S4	S5	
1		10				2								35.72				7.14						
2		20				4			10		20	6		3.57				0.71			16		34.6	9.5
3		10				2		10			10	4		1.79				0.36		16.6			4.4	4.2
4		20				4		10	10	30	10	12		5.36				1.07		10	6.3	15	2.2	6.7
5	90	10	20	40	40	40	100	50	40	50	30	54	81.7	6.25	6.7	7.7	40	28.47	100	43.4	27.1	20	22.2	42.5
6					20	4					40	8					20	4					22.2	4.4
7			40			8			10			2			20			4			6.3			1.3
8	10	70		60	20	32		30	40	50	40	32	10	47.31		15.4	20	18.5		30	26.8	17.5	14.4	17.7
9			20			4									66.7			13.3						
10			20			4			20	10		6			6.6			1.3			13.4	5		3.7
11										10		2										5		1
12				80		16				20		4				73.1		14.6				37.5		7.5
13	10			20		6							8.30			3.8		2.42						
14					20	4											20	4						
15									10			2									7.1			1.4
Total	110	140	100	200	100	130	100	100	140	170	150	132	100	100	100	100	100	100	100	100	100	100	100	100

Table (7): Effect of location and growth season on the fresh and dry productivity (Ton/ fed.) of native plants grown in Wadi El- Natron El Almeen distrcit during 1999-2000 seasons.

No. of plant species	Fresh productivity (Ton/ fed.)												Dry productivity (Ton/ fed).											
	Wet season					Total Wet	Dry Season					Total Dry	Wet season					Total Wet	Dry Season					Total Dry
	S1	S2	S3	S4	S5		S1	S2	S3	S4	S5		S1	S2	S3	S4	S5		S1	S2	S3	S4	S5	
1		0.02				0.02								0.02				0.02						
2		0.14				0.14			0.04		0.23	0.27		0.11				0.11			0.03		0.16	0.19
3		0.02				0.02		0.25			0.06	0.31		0.01				0.01		0.16			0.04	0.20
4		0.17				0.17		0.67	0.32	0.56	0.04	1.59		0.16				0.16		0.38	0.24	0.44	0.04	1.10
5	5.15	0.21	1.05	0.27	0.88	7.56	6.72	3.01	1.32	2.04	1.51	14.6	3.24	0.11	0.60	0.18	0.50	4.63	4.13	1.93	0.65	1.05	0.79	8.55
6					2.10	2.10					1.56	1.56					0.35	0.35					0.57	0.57
7			1.13			1.13			0.09			0.09			0.69			0.69			0.07			0.07

8	0.63	2.56		2.60	2.94	8.73		3.15	1.62	5.57	2.61	12.95	0.33	1.56		1.53	0.36	3.78		1.47	0.99	3.26	1.36	7.08
9			0.08			0.08									0.04			0.04						
10			0.27			0.27			0.16	0.04		0.20			0.14			0.14			0.10	0.04		0.14
11										0.42		0.42									0.27			0.27
12				1.47		1.47				0.40		0.40				0.20		0.20				0.04		0.04
13	0.08			0.29		0.37							0.04			0.15		0.19						
14					0.84	0.84											0.42	0.42						
15									0.32			0.32									0.15			0.15
Total	5.86	3.12	2.53	4.63	6.76	22.90	6.72	7.08	3.87	9.03	6.01	32.71	3.61	1.97	1.47	2.06	1.63	10.7	4.13	3.94	2.5	4.83	2.96	18.36

Table(8): Mean chemical content of different plant species at different sites in Wadi El-Natron El- Almeen road in wet and dry season.

Site	No.	Dry season								Wet season							
		Na	K	CP	CF	Ash	Fat	NFE	TDN	Na	K	CP	CF	Ash	Fat	NFE	TDN
1	5	0.59	0.25	9.9	23.5	16.2	7.7	42	37	0.26	0.26	14.6	12	14	7.8	46	37
	8									0.27	0.32	12.3	24	8.2	8.7	46	32
2	5	0.43	0.20	7.1	13.8	14.9	4.6	57.0	34.0	0.57	0.28	6.5	19.0	15.0	9.0	50.0	43.0
	3	0.22	0.31	6.3	37.3	6.9	9.4	39.6	39.9								
	8	0.12	0.18	13.6	25.5	7.5	7.0	45.0	23.3	0.33	0.14	10.0	23.0	9.0	10.0	47.0	32.0
	4	0.07	0.10	20.3	45.0	4.8	4.0	25.0	35.3								
	1									0.3	0.5	18.0	27.6	6.0	5.0	42.0	58.0
3	5	0.32	0.27	7.0	262	15.0	5.4	51	31.9	0.22	0.94	9.5	15	20	8.0	46	36
	10	0.14	0.27	6.4	38.9	6.9	6.4	41	44.9	0.07	0.30	13.0	37	7.0	9.0	34	35
	8	0.13	0.17	9.8	26.9	8.6	6.4	48	14.6	0.33	0.14	10.0	23	9.0	10.0	47	32
	2	0.37	0.27	6.4	27.3	11.4	10.4	44	37.5								
	7	0.33	0.17	6.3	38.0	7.4	6.4	41	47.5	0.13	0.21	4.2	37	9.6	7.2	41	38
	4	0.15	0.24	5.4	31.5	8.2	7.7	46	47.4	0.04	0.8	11.0	21	8.0	5	54.88	27
4	8	0.21	0.26	9.8	24.7	7.4	8.0	49	35.2	0.15	0.21	13.0	29.0	8.6	8.0	41	36
	9	0.15	0.77	15.6	16.5	12.4	8.4	46	10.5	0.37	1.9	14.4	12.0	20.0	9.8	41	9.0
	12	0.17	0.50	14.4	35.8	11.4	3.8	33.9	21.3	0.24	0.12	11.0	38.0	8.0	6.0	36	31
	5	0.58	0.38	9.5	15.0	18.4	7.6	48	29.3	0.34	1.08	11.3	19.6	17.9	7.9	42	34.2
	4	0.22	0.26	7.0	25.1	10.3	9.0	48.2	48.8								
	11	0.11	0.26	6.3	31.6	9.9	7.7	48.2	39.3								
	6	0.09	0.30	8.6	21.5	13.6	7.7	48.0	42.5								
	10	0.22	0.21	4.9	38.6	6.0	8.2	41.9	49.9								
5	5	0.38	0.48	7.3	18.2	22.0	6.0	45.5	32.7	0.024	0.46	7.3	26.0	18	6.3	42	35
	6	0.74	0.13	3.8	11.6	19.9	12.8	51.0	18.6	0.70	0.15	8.1	9.8	26	9.3	46	10.4
	4	0.30	0.28	6.3	26.0	9.7	7.3	50.0	50.0								
	3	0.22	0.17	5.0	34.5	19.8	11.7	36.6	38.6								
	13	0.37	0.45	12.8	32.5	9.4	11.4	33.0	37.5								
	2	0.30	0.18	6.4	42.0	6.9	7.6	37.0	43.5								
	8	0.26	0.18	6.3	27.5	8.9	8.7	48.0	35.8	0.13	0.23	15.0	26.0	6.7	8.2	44	30
	14									0.22	0.51	9.4	21	10	9.0	49	45