MINERALOGICAL COMPOSITION OF THE SAND AND SILT SUBFRACTIONS IN SOME SOILS OF SINAI PENINSULA, EGYPT

Journal

Abd-Allah, S. A., Abdel-Aziz, W. H. and Massoud E. E.

Soils, Water and Environment Res. Institute, Agric., Res. Center. Egypt

J. Biol. Chem. Environ. Sci., 2009, Vol. 4(1): 77-89
www.acepsag.org

ABSTRACT

A mineralogical study of the sand and silt subfractions were conducted on some soil profiles representing the soils of Sinai Peninsula. The soils under study are derived from two parent materials vary in their mineralogical composition. The soils of southern Sinai are drived from granitic parent materials, while calcareous ones are dominated at the North Sinai.

The objective of the current work is to throw light on the mineralogical composition of the sand and silt subfractions in the soils of Sinai peninsula which are derived from different parent materials.

The results indicate that the mineralogical composition of the sand and silt subfractions in the soils of South Sinai consist mainly of quartz, feldspars, mica-biotite and muscovite, heavy minerals and chlorite occur, also, but with less amount. Quartz content varies within narrow limits for each particle size. The high content of feldspars and mica in the subfractions is a contribution from igneous and metamorphic rocks dominated by granite and gneises rich in feldspars and micas.

With regard to the soils of North Sinai the results indicated that quartz grains are the main minerals, the associations are mainly mica biotite, mica muscovite, heavy minerals and feldspars. Chlorite has been detected in traceable amounts in some subfractions. Also, the results indicated that these soils contain less amounts of feldspars and mica than the soils of south Sinai; this reflect the nature of parent materials from which the soils are drived.

INTRODUCTION

Sinai Peninsula covers 61,000 km^2, extending between latitudes 27° 15′ and 31° 10′ North and longitudes 32° 10′ and 34° 30′ East. It is triangular in shape and is separated geographically from Egypt's main land by the Suez Canal and the Gulf of Suez. It is connected with the Asiatic continent a large 200 km. between Rafah on the Mediterranean Sea and the tip of the Gulf of Aqabo on the Red Sea. According to Said (1962 and 1990), El-Shazly *et al.*(1974) and Regwa(1981).

The core of the Peninsula situated near its southern and which consists of an intricate complex of high and very rugged igneous and metamorphic mountains. The northern two-thirds of the peninsula are occupied by a great northward –drainage limestone plateau which rises from the Mediterranean coast and extending southward, it ends in a high escarpment on the northern flanks of great igneous core. Also, the soils of Siniai peninsula are drived from two parent materials vary in their mineralogical composition. The soils of Southern Sinai are drived from granitic parent materials, while calcareous one are dominated at both central and North Sinai.

Mineralogical identification of the sand and silt sub fractions is carried out using staining method (Bosse, 1964) and the phase contrast microscope (Meyer *et al.*, 1967).

Phase contrast microscope is a rapid method for determining the mineralogical composition especially of the fine grain fractions which often have been neglected. Thus is because the mineralogical investigation of these fractions by means of the common polarization optical analysis meets with difficult. This analysis plays an important role because the alteration of mineral components by weathering processes in many cases will be reflected by mineralogical changes in the soil fractions between 60 and 1 micron. Moreover, the mineralogical analysis of the sand and silt sub fractions areeasier and more exact by rapid phase contrast microscope investigation.

The present work has been undertaken to provide the information about the mineralogical composition of the sand and silt fraction using the staining method and phase contrast microscope within the sand and silt subfractions. Also, the mineral composition has been influenced by the distribution of parent rocks in the studied soils.

MATERIALS AND METHODS

Soil sampling

Seven soil profiles were chosen from different sites representing Sinai Peninsula according to the difference of parent materials.

Two soil profiles representing the soils of wadi El-Arish (profiles 1 and 2) in the North Sinai, three soil profiles from El-Qaa plain (profiles 3, 4 and 5) and two soil profiles from wadi Feiran (profiles 6 and 7). The location of soil profiles is shown in Fig (1). These soil profiles were morphologically examined and the soil samples representing the morphological variations throughout the entire depths in each profile were collected, air dry and crushed to pass a 2mm seive.

Mineralogical analysis

Sand and silt sub fractions were separated by sieving, sedimentation and centrifugation procedure of Jackson(1965). Soluble salts were removed by continous dissolution with water; carbonate minerals were removed by NaOAC(pH5) and organic matter with H_2O_2. Free iron oxides were removed by citrate-bicarbonate-dithionite method.

Mineralogy of the sand and silt subfractions

A- Staining method

According to Bosse(1964), staining method has been proved for determining the mineralogical composition of the sand and silt fractions. About 2 g of samples was boiled with HCl (1:2) about 2 min. The acid was substracted and the sample was washed with distilled water 5 times. 10ml HF (48%) were added after 3min. also about 10 ml distilled water. HF was substracted and washed 4 times with distilled water. The samples was treated with saturated Na-Hexacobaltnitrite for 5 min., therefore, the sample was washed with distilled water. 10ml 0.5% alcohol hematine and 5 ml saturated Na-acetate were added for 10min., then the liquid is siphoned off. The samples were examined using stereomicroscope.

B- Phase contrast method: this method has proved to be a rapid method for determine the mineralogical composition of the sand and silt fractions, Meyer *et al.* (1967).

About 2 g of the sand and silt sub fractions were transfered on to the surface of glass slide which form a very thin layer. Then 1-2 drops of a mixture were added to the sample on glass slide (This mixture was made by adding Methyl phathalate (n=1.52) to Annamoldehyde (n=1.62) until n of the mixture was 1.54 using refractometer) and covered with a thin cover. The slide was examined with phase contrast microscope.

RESULTS AND DISCUSSION

Staining method and phase contrast microscope were applied to the analysis of soil fractions within sand and silt subfractions. The selected particle grades were coarse sand, medium sand, fine sand, very fine sand, coarse silt and fine silt.

Data in Table (1) show that the identified minerals in the studied fractions consist of quartz, feldspars, muscovite, biotite, heavy minerals and chlorite.

1-Quartz

Quartz content of the separated subfractions of the studied soil profiles varies within narrow limits for each particle size, Table (1) reveals that quartz constitutes the major component of almost unique pattern for some of the sand fractions particularly the coarse ones, while the other show apparent discontinuity

Data in Table (1) show that quartz minerals in the sand and silt subfractions in the soil profiles represented the soils of sedimentary origin (profiles 1 and 2) which are drived from calcareous parent materials ranged from (58.5 to 96.0%) and (37.0 to 63.3%), respectively, while quartz container the soils of the south Sinai which are drived from igneous and metamorphic rocks (profiles 3, 4, 5, 6 and 7) ranged from 85.3 to 98.5% and from 49.0 to 80.5% in the sand and silt subfractions, respectively.

Also, both sand and silt subfractions are dominated quartz. These results are in agreement with those reported by Thomas (1969). He attributed the decrease in quartz content with a decrease of particle size to natural sorting during sedimentation.

2-Feldspars

The data in Table (1) indicated that feldspars content of the studied subfractions varies from one profile to another but not throughout the layers of the same profiles.

According to the nature of parent material, the soil profiles represent the soils of sedimentary origin of wadi El-Arish (profiles 1 and 2) contain feldspars less than the soils of south Sinai which originated from igneous and metamorphic rocks of El-Qaa plain and wadi Feiran (profiles 3, 4, 5, 6 and 7). Values indicated that feldspars content of south Sinai soil profiles ranged from 3.5 to 17.1% and from 4.0 to 18.0% in the sand and silt subfractions. For calcareous soils of North Sinai (profiles 1 and 2) feldspars content varied from 0.8 to 1.9% and 1.4 to 2.9% in the sand and silt subfractions, respectively. Also, the low content of feldspars in wadi El-Arish soils in the North Sinai is results of the parent materials and the decomposition during the molticlic processes of sedimentation. On the other hand, the high content of feldspars in the soils of El-Qaa and wadi Feiran soils is contribution from the igneous and metamorphic rocks, rich feldspars. These results agree with the findings of Mason (1966) who reported that the major portion of the feldspars in sedimentary rocks are of igneous origin which formed accumulate in sedimentary environments as a weathering residue of igneous and metamorphic rocks.

It may be reported that feldspars content depends entirely on the types of soil parent material. Accordingly, soils of igneous and metamorphic rocks of South Sinai have higher content of feldspars than the calcareous ones, in North Sinai.

3- Mica: Micas in soils are largely and inherited from the parent materials. Muscovite and biotite are the most extensive micas in soils and rocks. Both are important constituents of many igneous, metamorphic and sedimentary rocks.

Data presented in Table (1) show that biotite content of the calcareous soils of North Sinai (profiles 1 and 2) ranges from 0.7 to 6.5% and 9.3 to 24.7% in the sand and silt subfractions, while muscovite content in these soil profiles varied from 0.6 to 3.5 and 5.7 to 26.0%. in the soils of Southern Sinai,(profiles 3, 4, 5, 6 and 7). Biotite ranges from 4.7 to 18.3% and 14.0 to 26.2% and muscovite from 0.5 to 8.6% and 8.5 to 29.1% in the sand and silt subfractions, respectively.

The presented values show the increase of mica content in the soil of southern Sinai originated from igneous and metamorphic rocks than the alluvial soils having calcareous parent material in North Sinai. Here, it is worth to mention that the obtained data are in close agreement with those of Jackson (1959 and 1964) who found that micas in most soil originate mainly from soil parent material and tend to weather to other minerals with time, they are more prevalent in the silt subfractions of younger less weather soils and are less prevalent in more weathered soils. The data also point out to the increase in quantity of biotite and muscovite with the decrease of particle size. This appears to develop because micas in coarser subfractions are broken down physically during transport or soil-forming processes, whereas other minerals such as quartz are more resistant to physical disintegration and accumulate in the coarser subfractions. Thus, micas are generally more extensive in fine grained sediments than in coarser textured sedimentary.

4-Heavy minerals

The heavy minerals of the studied soil subfractions were determined together because of the difficulties facing its identification with phase contrast microscope.

Data in Table (1) reveal that heavy minerals content in the calcareous soils sediments in the north Sinai varied from 0.5 to 3.5% and 2.2 to 3.7% in the sand and silt subfractions, respectively, while in the soils of southern Sinai ranged from 1.1 to 4.9 and 1.8 to 3.7% in the studied subfractions.

In general, heavy minerals content of the finer subfractions are relatively low comparatively with the coarse ones. Depthwise distribution does not portray any specific pattern with depth. Based on the foregoing presentation of the heavy minerals frequency and distribution in the studied soil profiles, one can conclude that most, if not all, heavy minerals do not display any particular pattern characterizing specific profile or locality. Values of heavy minerals (Table 1) indicated that there are variations in the studied profiles representing the soils of South Sinai and others of north Sinai. These variations reflect the non-uniformity of the parent material within both regions.

5- Chlorite

The data presented in Table (1) indicated that the content of chlorite to mineral in the investigated subfractions of the studied soil profiles is generally low and even absent in some subfractions.

The data also show that chlorite mineral content of the subfractions ranged from 0.3 – 1.1% and 0.1 – 0.8% in the sand and silt subfractions in the calcareous sediments in the North Sinai, while chlorite in the Southern Sinai ranged from 0.3 – 2.6% and 0.2 – 2.4%

in the sand and silt subfractions, respectively. Also, it could be observed that chlorite content is higher in the coarser fractions relatively to the finer ones.

With regard to the origin of soils, chlorite content is relatively very low in subfractions of calcareous profiles of wadi El-Arish. On the other hand, the soils of Southern Sinai which originated from igneous and metamorphic rocks contain relatively high amounts of chlorite within the studied subfractions.

Generally, chlorite in soils are largely inherited as primary products from minerals such as metamorphic or igneous rock or occur as alteration products from minerals such as hornblende, biotite and other ferro magnesium minerals; Richard (1977). Depthwise distribution of chlorite dose not shows any specific pattern with depth.

Quartz / feldspars ratios

To substantiate effect on the studied soils which are drived from various parent materials and subjected to different environmental conditions, Quartz/feldspars ratio is computed and presented in Table (1). The data show that these ratios varied with respect to soil origin, profile location, layering and particle size. Concerning soil origin, the variations encountered are mainly attributed to the different parent materials on which these soils are developed.

Data in Table (1) reveal that Quartz/feldspars ratios in the calcareous sediments of the North Sinai (profiles 1 and 2) varied from 44.9 to 115.3 and 20.4 to 53.7 in the sand and silt subfractions, respectively, while in the Southern Sinai (profiles 3, 4, 5, 6 and 7) which are represented the igneous and metamorphic rocks ranged between 3.4 to 24.0 and 2.3 to 11.7 in the sand and silt subfractions, respectively.

With respect to the origin of Quartz/feldspars ratio data in Table (1) indicate that the soils of Southern Sinai which originated from igneous and metamorphic rocks have Quartz/feldspars ratios less than that of calcareous soils of North Sinai. This is mainly due to the high content of feldspars in the soils of Southern Sinai, which reveal the effect of the parent material on Q/F ratio. Therefore, it could be concluded that most if not all, differences in Q/F ratios are inherited from parent material prior to sedimentation. Sedimentation regime exerted some additional variations but little or even no effect is rendered to in suit weathering.

Table (1): Mineralogical composition of the sand and silt subfractions of the studied soil profiles.

Location	Profile No.	Depth (cm)	Fraction	Minerals (%)						
				QZ	Bio.	Mas.	Feld.	H.M.	Chlo.	Q/F
Wadi El Arish	1	0-25	C.S	98.50	-	-	1.5	-	-	65.7
			M.S	97.20	1.0	-	1.0	1.2	-	97.2
			F.S	92.80	3.2	1.0	1.0	2.1	-	92.8
			V.F.S	87.80	5.2	2.2	1.2	2.5	0.5	73.2
			C.Si	78.15	10.4	8.5	2.2	3.7	0.1	35.5
			F.Si	51.90	24.7	18.5	2.3	3.3	-	22.6
		25-60	C.S	-	-	-	-	-	-	-
			M.S	95.2	0.7	-	1.2	0.9	-	79.3
			F.S	90.0	3.5	1.5	1.5	2.5	-	60.0
			V.F.S	85.3	5.5	3.5	1.9	3.1	0.5	44.9
			C.Si	76.8	9.3	5.7	2.3	3.4	-	33.4
			F.Si	50.5	19.5	20.9	2.3	2.5	-	21.9
		60-100	C.S	-	-	-	-	-	-	-
			M.S	97.5	1.5	-	1.5	0.9	-	65.0
			F.S	92.1	3.9	1.5	0.9	2.0	-	102.3
			V.F.S	85.5	6.5	3.3	1.2	2.9	-	71.3
			C.Si	72.5	12.6	10.4	1.9	2.8	-	38.2
			F.Si	52.2	19.3	23.5	2.3	2.8	-	22.7
		100-150	C.S	98.5	-	-	1.1	-	-	89.5
			M.S	97.1	1.5	-	1.1	02.9	-	88.3
			F.S	92.2	3.5	2.1	0.8	2.6	-	115.3
			V.F.S	85.5	5.6	3.5	1.1	3.5	-	77.7
			C.Si	71.5	13.3	10.4	2.1	2.9	-	34.0
			F.Si	49.0	24.3	22.9	2.4	2.2	-	20.4
	2	0-35	C.S	-	-	-	-	-	-	-
			M.S	95.5	1.5	-	1.2	0.5	-	79.6
			F.S	92.3	3.2	0.6	1.0	1.3	0.3	92.3
			V.F.S	90.0	4.0	1.9	1.3	1.9	0.6	69.2
			C.Si	74.1	10.6	10.8	1.7	2.2	0.6	43.6
			F.Si	49.5	19.9	26.0	1.7	2.4	-	29.1
		35-90	C.S	-	-	-	-	-	-	-
			M.S	96.0	1.3	-	1.3	0.5	1.1	73.8
			F.S	95.0	2.1	-	1.1	1.1	0.8	86.4
			V.F.S	88.2	5.2	1.8	1.4	2.2	0.3	63.0
			C.Si	80.5	10.6	8.9	1.5	2.5	0.8	53.7
			F.Si	51.7	20.5	22.5	2.3	3.0	-	22.5
		90-150	C.S	-	-	-	-	-	-	-
			M.S	-	-	-	-	-	-	-
			F.S	-	-	-	-	-	-	-
			V.F.S	89.5	5.0	2.3	1.3	1.8	-	68.8
			C.Si	76.4	10.5	8.5	1.7	2.5	0.4	44.9
			F.Si	52.7	20.5	22.3	1.4	3.1	-	37.6

CS: Coarse sand M.S: Medium sand F.S.: Fine sand V.F.S: very fine sand
C.Si: coarse silt F.Si: Fine silt
Q2 = Quartz Mas= Muscovite Q/F: Quartz/feldspars Bio= Biotite
Fed= Feldspar H.M.: Heavy minerals Chlo: chorite

Table (1): Cont.

Location	Profile No.	Depth (cm)	Fraction	Minerals (%)						
				QZ	Bio.	Mas.	Feld.	H.M.	Chlo.	Q/F
El-Qaa plain	3	0-20	C.S	96.0	-	-	4.0	-	-	24.0
			M.S	84.0	5.5	2.1	4.0	2.5	2.6	21.0
			F.S	75.0	12.2	4.0	5.4	2.3	1.0	13.9
			V.F.S	70.0	18.3	5.5	3.5	2.0	1.1	20.0
			C.Si	59.5	16.1	14.9	5.1	3.0	2.4	11.7
			F.Si	39.8	24.0	29.1	4.0	3.0	-	9.95
		20-70	C.S	95.0	-	-	5.0	-	-	19.0
			M.S	80.5	5.1	2.5	6.1	2.1	2.3	13.2
			F.S	70.3	10.5	4.1	7.5	2.0	1.6	9.4
			V.F.S	69.0	15.1	6.6	4.1	1.6	2.0	16.8
			C.Si	59.8	15.9	13.6	6.7	2.8	1.7	8.9
			F.Si	42.5	21.5	26.0	7.0	3.0	-	6.1
		70-110	C.S	95.0	-	-	5.0	-	-	19.0
			M.S	82.0	6.1	1.8	7.1	1.8	1.3	11.5
			F.S	77.0	10.2	5.1	5.8	1.2	0.8	13.3
			V.F.S	70.0	15.3	.6.5	6.9	1.6	-	10.1
			C.Si	59.1	17.0	13.6	6.6	2.3	0.8	8.9
			F.Si	40.0	26.0	24.5	7.0	2.3	-	5.7
		110-150	C.S	95.5	-	-	4.5	-	-	21.2
			M.S	80.3	8.0	2.9	7.0	1.8	2.0	11.5
			F.S	78.1	9.0	6.5	8.1	1.4	1.7	9.6
			V.F.S	67.5	14.0	8.6	7.6	2.7	0.3	8.9
			C.Si	53.0	19.9	16.2	6.6	2.8	1.6	8.03
			F.Si	38.5	23.5	27.5	7.7	3.4	-	5.0
	4	0-25	C.S	87.0	-	-	13.0	-	-	6.7
			M.S	71.9	10.5	2.1	9.0	2.5	2.0	8.0
			F.S	65.8	11.6	3.5	11.1	3.8	1.5	5.9
			V.F.S	62.1	14.1	6.9	12.2	3.0	2.0	5.1
			C.Si	51.9	16.9	12.9	14.0	2.7	1.4	3.7
			F.Si	38.5	21.5	21.0	16.5	2.3	-	2.3
		25-65	C.S	88.0	-	-	12.0	-	-	7.3
			M.S	77.0	9.0	1.1	9.1	2.0	2.0	8.5
			F.S	70.0	9.2	4.2	11.8	3.5	1.6	5.9
			V.F.S	60.5	13.1	7.1	13.2	4.8	2.0	4.6
			C.Si	50.9	15.0	13.5	17.6	2.2	0.8	2.9
			F.Si	39.5	16.5	21.0	15.5	2.3	-	2.5
		65-135	C.S	87.0	-	-	13.0	-	-	6.7
			M.S	74.5	8.2	2.1	11.2	2.2	2.2	6.7
			F.S	65.8	7.5	4.2	13.2	3.8	2.2	5.0
			V.F.S	58.5	13.2	7.3	17.1	2.8	1.8	3.4
			C.Si	52.3	16.0	15.3	14.0	2.2	0.5	3.7
			F.Si	42.3	18.5	19.0	18.0	2.2	-	2.4

CS: Coarse sand M.S: Medium sand F.S.: Fine sand V.F.S: very fine sand
C.Si: coarse silt F.Si: Fine silt

Table (1): Cont.

Location	Profile No.	Depth (cm)	Fraction	Minerals (%)						
				QZ	Bio.	Mas.	Feld.	H.M.	Chlo.	Q/F
El-Qaa plain	5	0-35	C.S	90.0	-	-	11.0	-	-	8.2
			M.S	81.0	5.4	2.0	7.0	3.0	1.6	11.6
			F.S	76.5	7.4	2.1	8.1	3.8	2.2	9.4
			V.F.S	72.9	11.2	4.5	8.0	3.2	1.5	9.1
			C.Si	63.3	15.6	10.8	5.4	3.7	1.3	11.7
			F.Si	41.8	26.2	21.0	8.5	2.8	-	4.9
		35-80	C.S	89.0	-	-	12.0	-	-	7.42
			M.S	79.1	5.1	3.2	8.0	3.7	1.2	9.89
			F.S	78.0	6.0	2.4	9.1	3.6	1.0	8.57
			V.F.S	71.5	10.7	5.6	7.5	2.7	1.5	9.53
			C.Si	61.0	15.2	11.7	5.9	2.8	0.5	10.34
			F.Si	41.3	22.7	25.2	8.5	2.3	-	4.85
		80-140	C.S	90.0	-	-	10.1	-	-	8.9
			M.S	82.1	4.7	2.1	8.2	1.3	1.0	10.01
			F.S	78.5	7.3	2.6	8.5	2.8	1.0	9.20
			V.F.S	74.2	9.0	4.8	7.1	3.5	1.5	10.50
			C.Si	60.2	15.8	13.8	6.5	3.3	1.0	9.30
			F.Si	37.0	22.9	27.5	9.0	3.5	-	4.10

C.S: Coarse sand M.S: Medium sand F.S.: Fine sand V.F.S: very fine sand
C.Si: coarse silt F.Si: Fine silt

Table (1): Cont.

Location	Profile No.	Depth (cm)	Fraction	Minerals (%)						
				QZ	Bio.	Mas.	Feld.	H.M.	Chlo.	Q/F
Wadi Feiran	6	0-40	C.S	85.5	-	-	16.5	-	-	5.2
			M.S	75.5	5.1	1.8	13.1	3.0	1.3	5.8
			F.S	70.2	7.5	2.5	11.0	4.1	2.0	6.4
			V.F.S	64.1	11.3	5.6	13.1	4.5	1.8	4.9
			C.Si	56.6	13.0	10.5	16.0	3.0	0.5	3.5
			F.Si	41.5	21.5	19.0	15.5	2.3	-	2.7
		40-90	C.S	85.0	-	-	18.2	-	-	4.67
			M.S	75.0	6.9	0.5	15.1	2.5	1.1	4.97
			F.S	68.2	8.1	4.1	13.5	4.9	1.1	5.05
			V.F.S	64.1	10.5	5.5	16.3	3.5	0.8	3.93
			C.Si	53.8	15.1	12.1	16.0	3.3	0.8	3.36
			F.Si	40.2	22.5	20.5	15.0	1.8	-	2.68
		90-150	C.S	87.1	-	-	17.1	-	-	5.09
			M.S	73.2	5.1	2.2	15.2	3.1	2.1	4.82
			F.S	70.5	8.3	4.5	12.0	4.5	0.5	5.88
			V.F.S	65.7	10.8	7.3	13.5	3.9	1.0	4.87
			C.Si	57.9	12.5	8.5	18.0	3.1	0.5	3.22
			F.Si	43.8	18.0	22.1	14.0	2.3	-	3.13
	7	0-25	C.S	88.5	-	-	11.5	-	-	7.70
			M.S	80.1	8.2	2.5	6.7	1.1	2.5	11.96
			F.S	75.7	11.0	1.0	8.5	2.3	2.1	8.91
			V.F.S	70.5	10.0	4.3	11.6	2.5	2.5	6.08
			C.Si	62.0	12.5	8.9	14.0	2.4	0.2	4.50
			F.Si	43.3	20.3	21.5	13.5	2.2	-	3.21
		25-70	C.S	91.5	-	-	9.2	-	-	9.95
			M.S	78.6	9.2	1.5	8.1	1.6	2.3	9.70
			F.S	72.5	13.9	1.5	8.9	2.6	1.5	8.15
			V.F.S	68.2	10.5	3.1	12.2	3.0	1.5	5.59
			C.Si	59.0	14.0	10.0	14.0	2.3	0.8	4.21
			F.Si	43.8	19.0	21.1	13.0	2.6	-	3.37
		70-110	C.S	90.2	-	-	11.5	-	-	7.84
			M.S	79.5	9.1	2.2	7.5	1.1	1.6	10.60
			F.S	73.2	12.2	1.3	9.1	2.5	2.3	8.04
			V.F.S	68.1	13.5	3.5	11.3	2.5	2.1	6.03
			C.Si	56.6	17.0	10.0	13.5	2.6	0.4	4.19
			F.Si	39.9	22.6	21.0	13.5	2.9	-	2.96
		110-150	C.S	90.5	-	-	11.5	-	-	7.87
			M.S	78.9	9.5	2.1	8.2	1.9	1.0	9.62
			F.S	73.2	13.2	2.0	8.1	2.7	1.2	9.04
			V.F.S	68.1	14.1	4.0	10.5	2.1	1.2	6.49
			C.Si	58.3	14.5	11.8	13.0	2.4	0.4	4.48
			F.Si	40.9	24.5	21.0	11.0	2.6	-	3.72

CS: Coarse sand M.S: Medium sand F.S.: Fine sand V.F.S: very fine sand
C.Si: coarse silt F.Si: Fine silt

REFERENCES

Bosse, I. (1964). Verwitterungsbilanzen Von Charakteristischen Bodentypen aus Flugsanden der nordwestakutschen Geest (Mittelweser-Gebiet). Band2, Verlag Th.Stenkopff, Leipzig.

El-Shazly, E.M.; M.A. Abd El-Hady; M.A.El-Ghawaby; I.A.El-Kassas and M.M.El-Shazly (1979). Geology of Sinai Peninsula from ERTS-1 Satellite Images. Remote Sensing Research and Technology, Cairo, Egypt.

Jackson, M.L. (1959). Frequency distribution of clay minerals in major great soil groups as related to the factors of soils formation. Clay &Clay Miner., 6:133-143

Jackson, M.L.(1964). Chemical composition of the soil. In Bear, F.E., Ed(Chemistry of the soil)3rd ed.Chap.2, Reinhold, Publ., New York

Jackson, M.L.(1965). Soil Chemical Analysis. Advanced course, Publ. by the auther, Dept. of Soil Sci. Univ.of Wisconsin, Madison, U.S.A.

Mason, B.(1966). Principles of geochemistry. 3rd ed. John Wiley & Sons, Inc., New York.

Meyer, B.; A. Gebbardt and F. Scheffer (1967). Rapid mineralogical investigation of coarse clay, silt and fine sand fractions of soils with the phase contrast microscope. Sanderdruck aus Zess-Mitteilungeng 9.

Regwa (1981). Reconna issuance soil survey of North Sinai area. Rept. Performed for GARPAD.

Richard, I. Bernhisel (1977). Minerals in soil Environments. (M.B. Dixon, Editor) Chap.10, publ.by Soil Sci.of America Madison, Wisconsin.

Said, R. (1962). The geology of Egypt. Elsevir publishing company, Amsterdam-New York,

Said, R.(1990). The geology of Egypt. Published for the Egyptian Central Petroleum Corporation Conco Hurghada Inc. by Balkema, A. A.,Roterdam, the Netherlands.

Thomas, R.L.(1969). A note on the relationship of grain size, clay content, quartz and organic carbon in some lake Erie and lake Ontario sediments. J. Sediment Petrol., 39:803-809.

التركيب المنرالوجى لمجاميع الرمل والسلت فى بعض اراضى شبه جزيرة سيناء، مصر

سامى عبد الجيد عبد اللة- وفاء حسين عبد العزيز – ايهاب السيد مسعود

معهد بحوث الاراضى والمياه والبيئة – مركز البحوث الزراعية-جيزة - مصر

تهدف هذه الدراسة الى التعرف على التركيب المنرالوجى لمجاميع الرمل والسلت فى بعض أراضى شبه جزيرة سيناء والتى تكونت من مواد اصل مختلفة ولتحقيق ذلك اختير سبعة قطاعات ارضية لتمثل وادى العريش فى شمال سيناء وسهل القاع ووادى فيران فى جنوب سيناء- وطبقا للاختلافات فى مادة الاصل فيمكن تلخيص النتائج فيما يلى:

- تشير نتائج التحليل المنرالوجى لمجاميع الرمل والسلت فى اراضى جنوب سيناء الى انها تتكون بصفة اساسية من الكوارتز والفلسبارات والميكابيوتيت والميكامسكوفيت وكذلك تشير الى وجود المعادن الثقيلة والكلوريت ولكن بكميات ضئيلة ويدل المحتوى المرتفع من الفلسبارات والميكات فى هذه الاراضى على تأثير مادة الاصل التى اشتقت منها حيث يسود بها صخور الجرانيت والنيس.

- وبالنظر الى اراضى شمال سيناء فتشير نتائج التحليل المنرالوجى لمجاميع الرمل والسلت الى ان حبيبات الكوارتز هى المكون الرئيسى بالاضافة الى وجود الميكابيوتيت والميكامسكوفيت والمعادن الثقيلة والفلسبارات كما وجد آثار من الكلوريت فى بعض المجاميع- يدل محتوى هذه الاراضى المنخفض من الفلسبارات والميكات بالمقارنة باراضى جنوب سيناء الى طبيعة مادة الاصل التى تكونت منها مثل هذه الاراضى.