

## QUANTITATIVE ANALYSIS OF MINERALS IN THE BRIGHT GREY-CINNAMONIC (CHESTNUT) SOILS FROM NAKCHIVAN AR

H.J.Mehdiyev

*Institute of Soil Science and Agrochemistry of ANAS*

5, M. Arif Str., Baku, 1073, Azerbaijan; huseyn.mehdiyev.59@mail.ru

Received: 21.06.14; accepted: 15.08.15

The bright grey-cinnamonic (chestnut) soils from Nakchivan AR don't extend much, they locate like spots in the West region and the East region is situated in the Nakchivan plain zones. In the soils quantitative analysis the West zones' bright grey-cinnamonic (chestnut) soils from d001 – 0.81 %, d002 – 2.37 %, d003 – 1.62 % with chlorites from minerals, d001 – 2.40 %, d002 – 3.20 %, d003 – 2.80 % with illite (hydroclude) and d001 – 1.65 %, d002 – 0.90 % with caolinite. The bright grey-brown (chestnut) soils from the east regions in the minerals quantitative analysis from d001 – 0.6 %, d002 – 2.00 %, d003 – 0.4 % with montmorillonite, d001 – 4.00 %, d002 – 2.4 %, d003 – 1.3 % with illite (hydroclude), d001 – 3.0 %, d002 – 0.5 % with caolinite, d001 – 1.62 %, d002 – 5.40 %, d003 – 1.62 % with chlorite.

### INTRODUCTION

The bright grey-cinnamonic (chestnut) soils as Little using soils were concerned the chestnut soils in the Azerbaijan zone. This is apparently received as a development conception of the chestnut soils. Some researchers of the world soil scientists' society received the chestnut soils like cultivating, culturing and irrigating chestnut soils. This is apparently concerned the grey-brown (chestnut) soils. A member of the World Soil Scientists' Society correspondent member of ANAS professor E.M.Salayev concerned these soils the grey-cinnamonic (chestnut) soils. A member of the World Soil Scientists' Society, a chairman of the Azerbaijan Soil Scientists' Society, an academician H.A.Aliyev, correspondent member of AS from the former USSR, an academician B.R.Volobuyev, an academician G.Sh.Mammadov, professor Sh.G.Hasanov, professor B.G.Shakuri and many others received these soils as chestnut soils, used in the researches widely. A member of the World and Azerbaijan Soil Scientists' Society, an academician M.P. Babayev, Phd. agr. V.H. Hasanov, phd. agr. I.M. Safarova, phd. agr. B.A.Safarov and others continue to receive these soils as grey-cinnamonic (chestnut) soils.

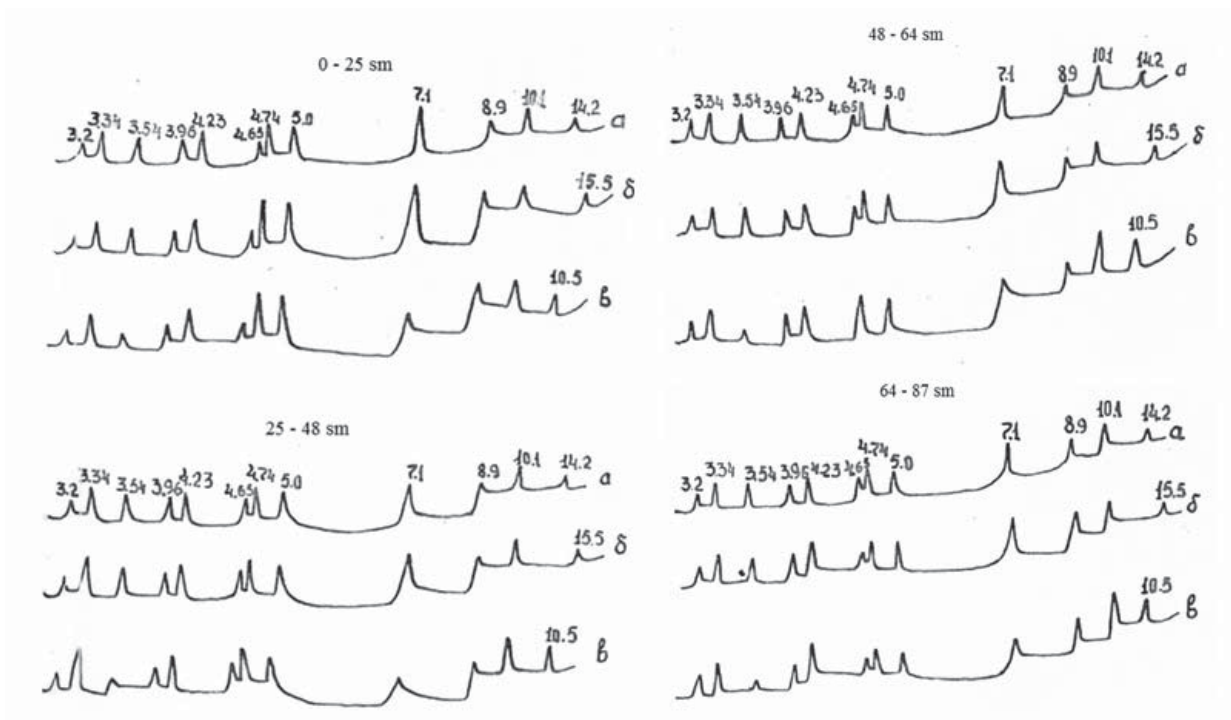
### OBJECTIVES AND METHODS

The bright grey-cinnamonic (chestnut) soils don't occupy large areas in the Nakchivan AR, they form like spots in the West region, they are formed from the deposits brought by the Arpachay (section 2). The soils in the east regions are also forming on the Nehram zones of the Nakchivan plain (section 6). The bright grey-cinnamonic (chestnut) soils of the Nakchivan AR regions consist of the Sharur-Culfa

zone's deposits and the Tirregeen originated the 3rd period calcareous rocks covering their surface and proluvial-delluvial deposits binging by the Araz river and modern period's alluvial rocks. [1] An analysis of the bright grey-cinnamonic (chestnut) soils physic-chemical characters shows that the soils are ensured with humus weakly (1.07 %), they partly extend over all the profiles. The upper arable layers (0-40 cm) aren't provided with carbonates, weak carbonates are found only on middle and low layers (8.50 %). We can receive these soils like cultivated and irrigated soils type (humus and carbonates distribution over the profiles) [2-12].

### RESULTS AND ANALYSIS

It was fixed by studying the bright grey-cinnamonic (chestnut) soils silt fractions that the weathering and crushed processes also cause one and half of oxides formation by indicating an effect on mineral forming. The clay minerals showing it are a reason for independent minerals formation. Sometimes one mineral is identical with other minerals. Sometimes this identity doesn't feel identical with the minerals quantitative analysis. Being connected with the soil chemical structures these combinations in the silt fractions they mainly consist of calcium, magnesium. The minerals quantitative analysis causes genetic soil science formation, turning-weathering processes intensification. The minerals quantitative analysis is related with the silt fractions compositions, shows, itself in each soil type. Giving the minerals using gradations by defining independent minerals some authors used methods in minerals quantitative analysis.



**Fig.1.** The curves of the bright grey-cinnamonic (chestnut) soils silt fractions in Rentgendefractograms of the West region (section 2).

*a* – in the whole dry state; *b* – while saturating with glycerin; *v* – while heating to 550° C.

The bright grey-cinnamonic (chestnut) soils of the West regions aren't ensured with montmorillonites in the silt fractions, they are found only on the maternal rocks. It was the highest mineral magnesian chlorite mineral and shows itself on the low peaks: 1.420 nm, 0.700 nm, 0.474 nm.

The illite (hydroclude) mineral extend on the whole profile widely and is found on the upper, middle and low layers and it is represented with the following peaks in the silt fractions: 1.01 nm, 0.500 nm, 0.334 nm.

The caolinite mineral don't spread in these soils widely, it shows itself only in the mixedschisted combinations it is represented with the following peaks: 0.710 nm and 0.354 nm.

In the minerals quantitative analysis the silt fractions of these soils are commented, their areas are fixed in the ornaments and the obtained figures are multiplied by 100 and the independent minerals quantitative analysis is determined [4-8].

Chlorite from high dispersion minerals d001 – 0.81 %, d002 – 2.37 %, d003 – 1.62 %. In the quantitative analysis

of the illite (hydroclude) mineral d001 – 2.40 %, d002 – 3.20 %, d003 – 2.80 %.

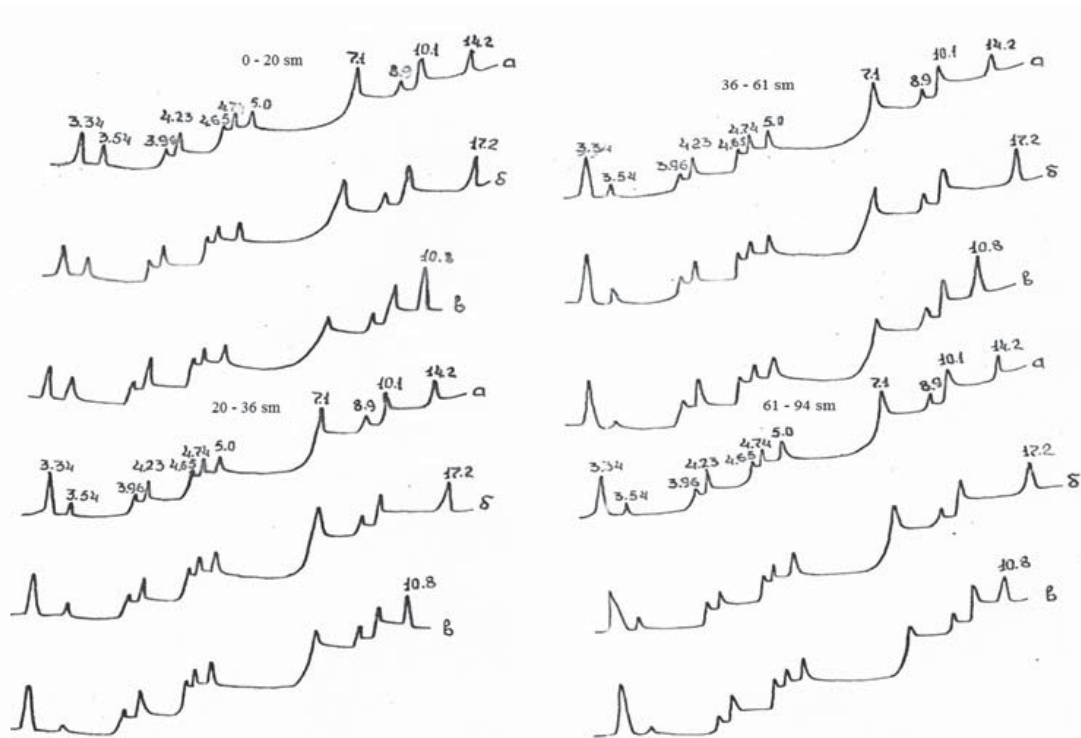
In the quantitative analysis of the silt fractions mixedschisted minerals the chlorite mineral's peaks reach d001 – 1.35 %, while heated to 5500 d001 – 1.35 %.

This is probably connected with the mixedschisted combinations which are created chlorite-montmorillonite.

The illite (hydroclude) majority gradual splintering the rocks having arid climatic zones creates a condition for formation of the illite (hydroclude) typical combinations in their fractions. On other hand this is connected with the rock structures creating the bright grey-brown (chestnut) soils.

The climatic factors formed in the arid dry subtropics differing from the extra-arid soils, causing the little reduction of the fertility resource influence on rocks structures.

Formation of these combinations peculiar to the caolinite group is d001 – 1.65 %, d002 – 0.90 % in the minerals quantitative analysis.



**Fig.2.** The curves of the bright grey-cinnamonic (chestnut) soils silt fractions in Rentgendifractograms of the East region (section 6).  
*a* – in the whole dry state; *b* – while saturating with glycerin; *v* – while heating to 550° C.

Distribution of the high dispersion montmorillonite over the whole profiles in the Nakchivan AR and extending in the silt fractions are connected with some depth of the mineral forming rocks, weathering, mineral forming rocks. Montmorillonite in Rentgendifractograms shows itself in the following peaks: 1.420 nm, 0.710 nm, 0.474 nm. The illite (hydroclude) mineral shows itself in the silt fractions 1.01 nm, 0.500 nm, 0.334 nm. The caolinite mineral represents its peaks: 0.710 nm, 0.354 nm.

In the minerals quantitative analysis montmorillonite mineral reaches d001 – 1.00 %, d002 – 1.60 %, d003 – 0.50 %. While saturating with glycerin the montmorillonite mineral reaches 1.00 % on the peaks, but it reaches 1.80 %, while heating to 5500C. In the minerals quantitative analysis a majority of montmorillonite on the upper and middle layers, their reduction on the low layers cause the whole disturbing of the montmorillonite, forming of the mixed layer combinations.

The illite (hydroclude) mineral reaches d001 – 4.00 %, d002 – 2.40 %, d003 – 4.40 % in the mineral quantitative analysis. The illite (hydroclude) mineral majority is related with the dry subtropics regions having minerals. It extends over the whole profile.

The caolinite mineral reaches d001 – 2.40 %, d002 – 1.05 % in the quantitative analysis. This is connected with the minerals forming the soils and intensive irrigated waters.

Generally, the mountain soils are connected with the hardened rocks, and distinguished with caolining rocks majority.

#### CONCLUSION

1. These changes forced in the bright grey-cinnamonic (chestnut) soils' mineralogical compositions are related with a climatically condition having a dry subtropics climate in the Nakchivan AR. These soils can be compared with the zones possessing an arid climate of the former USSR zone.
2. Extending the minerals in the silt fractions of the Nakchivan AR possessing a high climate caused consisting of the West zones' soils from some young rocks and majority of magnezial-chlorite, illite (hydroclude) collecting of montmorillonite and caolinite combinations on the layers, spreading of the mixedschisted combinations.
3. The montmorillonite majority of the silt fractions in the east regions part is a reason for magnezial-chlorite weakness, illite (hydroclude) majority on the all profiles.

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### **КОЛИЧЕСТВЕННЫЙ АНАЛИЗ МИНЕРАЛОВ В СВЕТЛО-СЕРО - КОРИЧНЕВЫХ (КАШТАНОВЫХ) ПОЧВАХ НАХИЧЕВАНСКОЙ АР**

**Х.Д. Мехдиев**

Светло-серо-коричневые (каштановые) почвы распространены в Нахичеванской АР. Они в основном встречаются в Западной и Восточной частях региона. В почвах Западного региона содержание хлорита составляет d001 – 0.81 %, d002 – 2.37 %, d003 – 1.62 %, иллита (гидрослюда) d001 – 2.40 %, d002 – 3.20 %, d003 – 2.80 %, каолинита d001 – 1.65 %, d002 – 0.30 %. В почвах Восточного региона содержание монтмориллонита равно d001 – 0.6 %, d002 – 2.00 %, d003 – 0.4 %, иллита (гидрослюда) d001 – 4.00 %, d002 – 2.4 %, d003 – 1.3 %, каолинита d001 – 3.0 %, d002 – 0.5 %, хлорита d001 – 1.62 %, d002 – 5.40 %, d003 – 1.62 %.