КЛАССИФИКАЦИЯ И НОМЕНКЛАТУРА ПОЧВ

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SOIL CLASSIFICATION OF THE REPUBLIC OF ARMENIA AND NOMENCLATURE ACCORDING TO INTERNATIONAL STANDARDS

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Abstract. The Republic of Armenia is a small mountainous country scarce in soil, where as all the components of the landscape, including soil cover are subjected to upward zoning patterns. The classification of all genetic soil types separated in the territory of the republic is based on the criteria presented in International World Reference Base for Soil Resources (WRB).

Key words: soil, World Reference Base for Soil Resources (WRB), an international classification, zonal soils, azonal soils.

INTRODUCTION

In international conference of soil scientists held in Montpellier in 1998, a decision was made about creating a common language of soil scientists around the world and Management Base for Soil Resources – World Reference Base for Soil Resources (WRB), which will facilitate contacts between soil scientists of different countries [1].

The origin of soil formatting maternal rocks, composition, nature, climatic conditions, the origin and properties of soils, soil use opportunities in different sectors of economic activity, environmental restrictions, and so on are taken into account for the classification of soils according to international WRB system.

International WRB system was developed and implemented by the international group of soil scientists of different countries of the world [2, 3].

The following is the classification of soils of the Republic of Armenia and nomenclature according to international WRB system.

The Republic of Armenia is a typical mountainous country, poor in soil resources, where heterogeneous geological structure of the area and heterogeneous nature of soil formatting mother-types, morphological and morphometric difficult conditions of relief, the diversity of climate and vegetation, as well as the influence of anthropogenic factors have contributed to the formation of spotted soil cover. Depending on differences in surface altitude levels, the whole complex of soil formatting factors varies according to altitude, conditioning upward zoning distribution of soils. Depending on the specific physical -geographical conditions of each upward zone, genetic types, subtypes, species of soils have been formed and evolved, which are quite different in their origin, composition, structure and agro-industrial properties, which replace each other from lowlands to mountain peaks [4, 5].

OBJECTS AND METHODS

The compliance of the names of all soil types existing in the territory of the Republic of Armenia with the standards of international WRB system served as research material. Soil cover of the republic served as the object of the research. Research has been carried out according to the criteria adopted by the WRB system.

RESULTS AND DISCUSSION

Soil cover studies allowed to identify 14 genetic types, 27 subtypes, numerous genus, species, varieties and options of soils in the territory of the Republic of Armenia. 8 from 14 types of soil have regular zonal nature and occupy 83.1 % of the country's territory. The total area of intrazonal soil types is 4.2 % of the country's

territory. The rest of the country's territory - 12.7 % is under radical rock exits, rock outcrops, ponds and buildings. According to upward zones, while moving from lowlands to uplands, the following main genetic types of soil are separated [6, 7].

Irrigated meadow brown soils (Anthrosols) – The name Anthrosols is given to those soils on the formation of which the human influence is considerable [8]. These soils were formed within the range of 800-950 meters in sloping-plain part of the Ararat Valley both in the conditions of active influence of anthropogenic factor and in ground and surface moisture conditions. As the use of these soils has a history of centuries in agricultural production, therefore, they have been separated and comply with the name Antrosols of International Classification [9].

Hydromorphone saline-alkaline soils (Solonetzes-Solonchaks) name comes from the Russian word *солонец* and *солончак* without any change. These soils were formed in those natural areas of the Ararat Valley, where the level of mineralized groundwater is close to the soil surface. Soil salinization and alkalinization is conditioned by a number of water-geological factors. The high level of mineralized groundwater conditions their evaporation from surface which leads to soil salinization and alkalinization. The total area of Saline-alkali soils is about 30 thousand hectares. According to the international classification scale, hydromorphone saline -alkaline soils are consistent with Solonetzes - Solonchaks name.

Paleohydromorphic connected alkaline soils (Solonetzes) were formed on the maternal rocks of marine origin having clay composition of different colors and they are mainly spread in the south-eastern districts of Yerevan. Paleohydromorphic connected alkaline soils have non -improved agro-physical properties, for that reason they are not used in agriculture. As these soils have strong alkaline reaction, are connected and alkalized, therefore they comply with international name Solonetzes.

Semi-desert brown soils (Calcisols), from the Latin word calx – Semi-desert brown soils are disseminated in Ararat valley within the range of 850-1250 meters in foothill zone of the mild slope circling the valley. Over 60 % of the total area of soils is eroded, 33 % of which is weakly eroded, and 27 % is medium and strongly eroded. Semi-desert brown soils contain large amounts of carbonates. Taking into consideration this circumstance, it is separated and renamed Calcisols, which corresponds to the international classification scale.

Chestnut soils (Kastanozems) from the Latin word *castanea* – chestnuts and from the Russian word *зем-* soil. Brown soils are disseminated in Ararat Valley within the range of 1250-1950 meters altitude of Vayk and Zangezur. The level of soil erosion is quite high, around 87 %, 46 % of which is weakly eroded, 41 % is medium and strongly eroded and soils not exposed to erosion constitute only 13 % of the territory. Mountainous brown soils were formed in relatively arid climatic conditions and with their basic properties correspond to the name Kastanozems.

Mountainous black soils (Chernozems) from the Russian word – *чернозем*. They were formed within the range of 1300-2450 meters altitude of the Ararat Valley, Shirak and Lori plateaus, Sevan basin and Syunik. Weakly eroded soils constitute 30 %, medium and strongly eroded soils constitute 12 %. Mountainous black soils are characterized by a high content of organic substances and by the saturation of absorbing complex. According to Russian and international classification it has not been changed and bears the same name Chernozems.

Meadow black soils (Chernozems) were formed in the steppe zone in the place of the distribution of black soils, in groundwater or surface moisture conditions. They are mainly disseminated in Se-

van basin, Shirak and Lori fields. These soils are very similar to washed black soils with morphological and physico-chemical properties. But the unique hydrological conditions contributed to a significant increase in the number of organic materials in lower layers. These soils are not exposed to erosion. Meadow black soils are very similar to black soils by almost all the features, for that reason they are also named as Chernozems:

Flood-plain-terraced soils Antrosols (Fluvisols) from the Latin word *fluvius* – river. These soils were formed in river valleys, in their terraces and floods in different moisture conditions and have a long history. In conditions of complex mountainous relief and unstable water regime of rivers soils with spotted mineralogical and mechanical composition were formed, which mainly have the ribbed structure. In the soils formed in hydromorphic conditions meadow-swamp and meadow soils are developed, and in areas where there is no ground nurturing meadow soils are disseminated [8]. The total erosion level of the soils is 12 %. As these soils were formed in the floods of river valleys, mostly in 2-4 terraces, they have been used in agriculture for centuries, there it is advisable to separate it as Antrosols, Fluvisols, which is completely in line with international classification standards [10].

Groundsoils of Lake Sevan (Regosols) – from the Greek word *ρεγος* - blanket, which means a soft mass that covers the solid rock layers [11, 12]. As a result of the use of Sevan Lake water for irrigation and energetic purposes, about 18 thousand hectares area was freed from the bottom of the lake where ground-soils started to form. The composition and properties of groundsoils are conditioned by the physico-chemical and biological processes under the lake. Here, depending on the level of groundwaters the intensity of soil formation processes takes place at different speeds. The renaming of these soils as Regosols corresponds to the international classification standards.

Cinnamonic forest soils Acrisols (Cambisols) from the Latin word *acris* - acid and *cambiare* – to change. These soils are mainly spread within the range of 500-1700 meters altitude above sea level of the northeastern Armenia and Zangezur and in the dry southern slopes it stretches up to 2400 meters altitude. Brown forest soils with limited space, in particular in the form of small islands are met in the southern and southeastern slopes of Sevan and Urts mountain chains and in low-lying areas of Aragats. Almost 70 % of soils is exposed to erosion, 36 % of which is weakly eroded, 34 % is medium and strongly eroded.

Sod carbonate forest soils Acrisols (Cambisols) are disseminated in the average altitude of Gugarats, Hakhum and Bargushat mountain chains. These soils are formed on the carbon-rich maternal rocks and develop in sparsely forested areas, where sometimes the steppe-making process is going on in the presence of cereal vegetation. 13 % of the total area of the mentioned type of soil is weakly eroded, medium eroded soils constitute only 7 %.

Brown forest soils Acrisols (Cambisols) – occupy northeastern slopes of the altitude of 1300-2250 m of Armenia. Weakly eroded soils constitute 23 % of the territory, medium and strongly eroded soils constitute 6 % [13].

All three main types of soil of the forest zone correspond to the name Acrisols.

Meadow prairie soils (Phaeozems) from the Greek word *φαιος*- dark and from the Russian word *зем* - soil, which reflects the black colour of soil and the high concentration of organic materials.

These soils are disseminated in the meadow, prairie, partly in the lower parts of the alpine zone within the range of 1800-2600 m above sea level. The climate is moderately cold and moderately humid. 23 % of the total area of the soils is weakly eroded, and 17 % is medium and strongly eroded. Soils not exposed to erosion constitute 60 % of the territory.

Mountainous-Meadow Soils Umbrisols (Leptosols) from the Latin word *umbra-* shadow and from the Greek word λεπτος – thin. They were formed within the range of 2200-2600 m above sea level on fragmented slopes, under the short and dense alpine vegetation. These soils are characterized by a high content of humus and organic materials. Taking into consideration this circumstance, it is advisable to rename the mountainous-meadow soils as Umbrisols. The soils exposed to weak erosion constitute 17 % of the territory, the soils exposed to medium and strong erosion constitute 9 %, and the soils not exposed to erosion constitute almost 74 % of the territory [9, 14].

CONCLUSION

According to the international WRB system, as a result of naming, the soil types of the territory of the Republic of Armenia have received the following names:

Irrigated meadow brown soils, floodplain-terraced soils - (Anthrosols)

Hydromorphone saline-alkaline soils and Paleohydromorphic connected alkaline soils - (Solonetz-Solonchaks)

Semi-desert brown soils - (Calcisols)

Chestnut soils - (Kastanozems)

Mountainous black soils and meadow black soils - (Chernozems)

Groundsoils of Lake Sevan - (Regosols and rock outcrops)

Cinnamonic forest soils, Sod carbonate forest soils and Brown forest soils - (Acrisols, Cambisols)

Meadow prairie soils - (Phaeozems)

Mountainous-Meadow Soils - (Umbrisols, Leptosols).

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ТҮЙІН

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АРМЕНИЯ РЕСПУБЛИКАСЫНЫҢ ТОПЫРАҚТАРЫНЫҢ ҚАБЫЛДАНҒАН ХАЛЫҚАРАЛЫҚ КРИТЕРИЯЛАР БОЙЫНША ЖІКТЕМЕСІ МЕН НОМЕНКЛАТУРАСЫ

Армения Ұлттық аграрлық университетінің филиалы «Г. Петросян атындағы топырақтану, агрохимия және мелиорация ғылыми орталығы», 0004, Ереван, Адмирала Исакова көшесі 24, Армения Республикасы,

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Мақалада Армения Республикасының топырақтарының жаңа халықаралық жіктемесі мен номенклатурасын зерттеу жұмыстары туралы баяндалады. Республика аумағындағы барлық топырақ типтері мен типшелерінің жіктемесі Топырақ ресурстарының әлемдік реферативті мәліметтер Базасына: World Reference Base for Soil Resources (WRB) негізделіп жасалынған.

Түйінді сөздер: топырақ, топырақ ресурстарының Әлемдік Реферативті Мәліметтер Базасы, халықаралық жіктеме, аймақтық топырақтар, аймаққа тән емес топырақтар.

РЕЗЮМЕ

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КЛАССИФИКАЦИЯ И НОМЕНКЛАТУРА ПОЧВ РЕСПУБЛИКИ АРМЕНИИ ПО ПРИНЯТЫМ МЕЖДУНАРОДНЫМ КРИТЕРИЯМ

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Статья посвящена изучению новой международной классификации и номенклатуры почв Республики Армения. Классификация всех типов и подтипов почв территории республики сделана на основе Мировой Реферативной Базе Данных для почвенных ресурсов: World Reference Base for Soil Resources (WRB).

Ключевые слова: почва, Мировая Реферативная База Данных для почвенных ресурсов (WRB), международная классификация, зональные почвы, азональные почвы.