

ANTHROPOGENICLY CHANGED SODDY- PODZOLIC SOILS OF THE EAST PART OF DEYMA BASIN

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ABSTRACT

Anthropogenically changed soils are very interesting for investigators. Studies conducted on 3 key plots with the purpose of study of current state of a soil mantle of basin river Deyma, have revealed an inaccuracy of existing cartographical data. The chemical and physicochemical properties of the anthropogenically changed soils are considered.

KEYWORDS

Soddy-podzolic soils; Anthropogenic changing; Deyma basin; Key plot; Chemical and physico chemical properties

1 INTRODUCTION

It is known, that economy activity of human is a important pedogenetically factor. Soils are using in agriculture are changing its physical, chemical and morphological properties. Because anthropogenetically changed soils are distinguishing in new classification system as separate type [1].

The object of research is soddy-podzolic soils in Deyma basin, such as very important element of ecosystem of Baltic region. This soils are most wide-spread in Kaliningrad region [2].

River Deyma, fall in Curonian Gulf, is very interesting for investigators, because it is the arm of river Pregolja and, simultaneously – the channel, that was built in 1395[3]. Alluvial soils are forming under effluence water of Pregolja and water of Curonian Gulf [4].

Soils of Deyma basin are different. Genesis of this soils is not sufficiently studied by pedologists [5]. The aims of this research are investigation of morphological, chemical and physico-chemical properties anthropogenically-changed soils and made the soil survey for studying of modern state of soil mantle.

2 OBJECT AND METHODS

Investigations has carry out in 2002 –2005 years on three key plots (see *Figure 1*), that was found on right (east) bank of Deyma river. Field research are including the soil, geobotanical

and topographic survey. At the time of research was studied more 16 soil profile. The obtained data of soil survey was collate with the data, that has made in 1979 [6].

Laboratory study was made are folloing. Content of mobile forms potassium and phosphorus, humic content, ratio of cation exchange, hydrolytical acidity and pH was dilute by standard methods (defining humic by Tyurin, ratio of cation exchange by Kappen and Gilkowitz, hydrolytical acidity by Kappen, mobile form phosphorous and potassium by Kirsanov) [7].

3 RESULTS AND DISCUCEED

Key plots № 1 (Izobil'noe) was found on geochemical catena. Soil mantle is present by sandy and loamy soddy-weakly-podzolic soils, usually have next composition: A₀-A₁-A₂B-B₁-B₂-BC-C. Result of anthropogenicly changing is transformation upper horizons into A_{arable} or AB_{arable}.

Loamy sand soddy weakly -podzolic soils overlying the placers, are characterized the lowing pH from 6,4 in upper horizons till 4,65 in horizon C. Humic content in anthropogenicly changed arable horizon is low (1,5 %). Ratio of cation exchange has a tend to increase in low horizons, has a maximum level in horizon BC. The significance of content mobile phosphorous and potassium present in *Figure 2*.

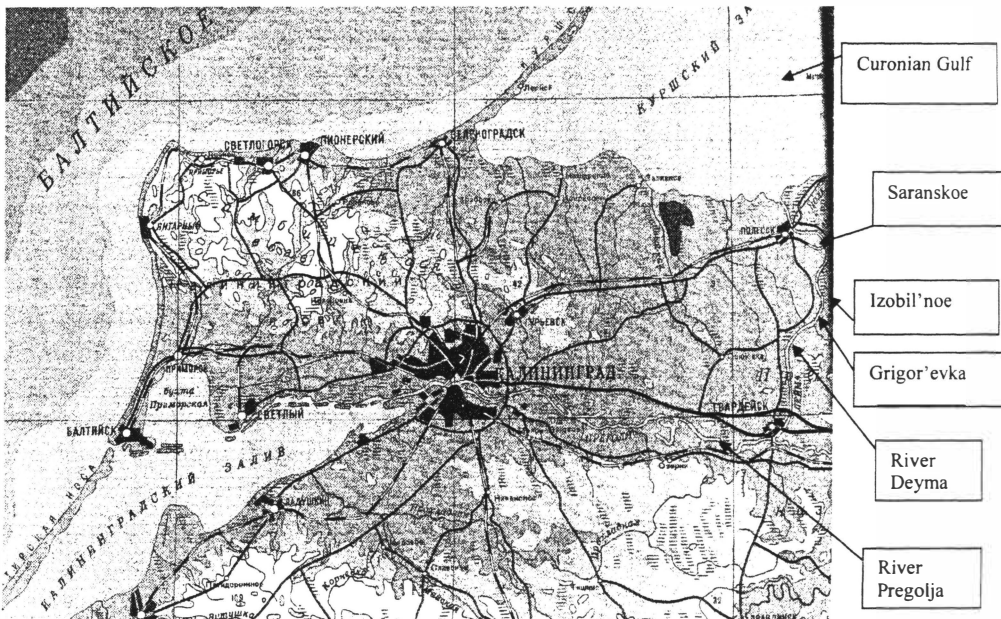


Figure 1. The statement of key plots in Deyma basin.

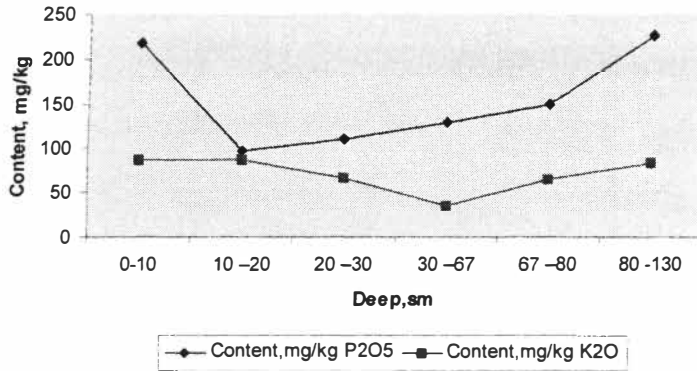


Figure 2. Content mobile forms of phosphorous and potassium in loamy sand soddy weakly-podzolic soils.

Soils of slopes is presenting by sandy loam soddy weakly-podzolic soils. The soil water in low horizons have alcality reaction because parent rock is calcareous clay. Level of humic content is extreme low (0,5 %). In horizon B (on deep 25-63 sm) observe the lowering content of mobile forms of phosphorous (see Figure 3). It may be a result of migration processes in soil.

The data's of soil survey made in 1979 is not corresponding the modern situation because soils overlying territorial of key plots was marked such as alluvial soddy soil [6] but alluvial soddy soils overlying the low part of slopes.

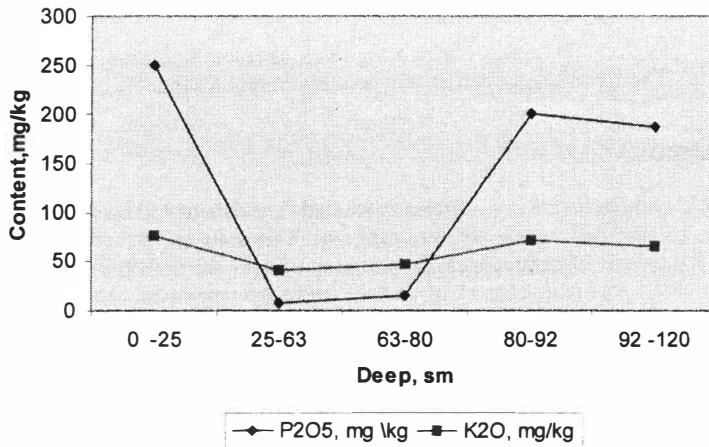


Figure 3. Content mobile forms of phosphorous and potassium in sandy loam soddy weakly-podzolic soils.

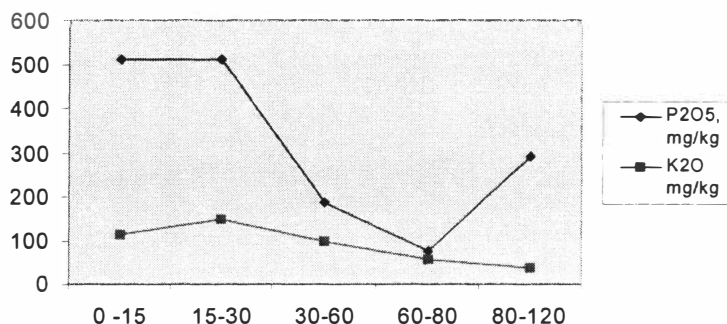


Figure 4. Content mobile forms of phosphorous and potassium in agrostratozem.

Key plot № 2 (Grigor'evka) found on weakly-wavy morain plain. The soil map, compiled in 1979, showing that soil survey of this plots is homogeny. But this sentences is not correctly. This soils have different level of anthropogenic changing. In soil profile may be observed the buried horizons or shearing of upper horizon formed under effluence of equiplanation. High level of anthropogenic effluence cause the transformation soddy weakly-podzolic soils into especially soil type – agrostratozem [8]. This soil have anthropogenic genesis because consumption of soil profile is very strong transformed. The upper horizon of natural soil was buried by ground removed from sheared soil. The content mobile form of phosphorous and potassium present in *Figure 4*. Very high index of phosphorous may be result of uneven broadcast of organic fertilizers. The extreme low humic content (0,6-1,5 %) is evidence of soil erosion.

Soils of key plot № 3 (Saranskoe) have a big deep of arable horizons. The buried horizons observed also. The chemical properties will be study in recent time.

4 CONCLUSIONS

The soils of Deyma basin are not sufficiently studied. The data of soil survey, made in 1979 is not correct, because soil mantle are very different. This soils are anthropogenically changed. The main indication of anthropogenically changing of soil are transformed soil profile, low content of humic and high content of mobile forms of potassium and phosphorous. The extremely low content of humic is evidence of soil erosion. This result is important for monitoring of ecosystems Deyma basin.

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