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## **Influence of relict forests of humid subtropics on yellow soils**

### **Influence des forêts reliques sur les sols jaunes**

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Research of genesis of the Talysh original soil types and dynamics of their process allows us to find out peculiarities of soilforming and interaction between soils and types of forests. Scientific and practical meaning of this issue is of great importance in solution of different tasks on protection and rehabilitation of forests and bushes of Girkhan nature, propagate of natural recourse of the region and its rational utilization. Urgence of this problem covers a lot of scientific and practical tasks on the nature utilization not only within Lancaran region, but also in a major part of the Caspian region of Iran with its 80% of rice production, 2/3 citric production and a whole national production of tea (Shakuri, 1993). Research of evolution and environmental peculiarities of Talysh relict forests and their interaction with soil cover is very important from the scientific point of view: finding out the cause of these forests shortening, disbalance of volume and a character of the environment; impact of intensive nature destruction. It is necessary to work out concrete steps in order to rehabilitate and to enrich environment and to protect it in future. Now our republic is independent and the issue of ecology protection in whole make our scientist to be more involved in. Most original relict soil of Lancaran region (Talysh) are mountainous forest yellow soil, yellow podzolic and yellow gley. Typical representatives of these soils are still under the main dominants of these forests (Girkhan forest reserve) where they had been comprehensively studied together with modern relict forests. Out of preserve their anthropogens and other irregular variations were studied. The classification of these forests is disputable from some point of view and it requires a detailed study. But it is another theme to be discussed. In this report we use the classification of R. Kovalev (1996). Main soil process under the relict forests reserve are yellow soil formation appeared on strong weathering crust of yellow soil and on the materials of their overdeposits. They are characterized by accumulation of sesquioxides of iron (8-12%) and aluminium (18-25%) with a great loss crenic acid of alkali soils. Claying, loessivation, siltation, ground and easy gley, pseudopodzolic and other processes are bound up with the development of local lithoclimatic conditions of soil formation. Frequency of their development is bound up with season contrast of soil humidity (autumn and winter maximum and dry summer), geomorphological conditions of their location and the type of weathering crust of yellow soil. Most characteristic features of these soils are indicated in the works of R. Kovalev (1966), V. Volobuyev (1973), B. Gasanov (1973 1992), F. Aliyev (1992, 1994, 1995) etc. It is a fact that out of preserves under the influence of human activity, cruel cutting down of forests, cattle pasturing ,

development of land selection into the forests, especially on the plain great physico-chemical changes of soil and forests' compositions occurred. Miraculously in northern parts of plain relict forests groups survived on brown soil with characteristic of yellow soils of ancient relict forests. It became clear that for last 500-1000 years the soil areals of relict forests are reduced from 480 or 500 thousands till 160 thousands hectares. It is also proved by fragments of relict forests: *Parrotica*, *Persica*, *Quercus Castaneifolia*, *Albizzia Julibrissih*, *Zelkova Hurcana*, *Ruscus Hurcanus* and others. Peculiarities of the ancient soil-forming process remain on Talysh plateau (F.Gasanov, 1984; B. Gasanov, 1986) and on foot-hills 80% of territory of which is developed. It became obvious that modern yellow-grey and brown forests' soils of Talysh surrounded by relict forests should be considered as soils descended from typical yellow and probably red soils from more warm subtropical climate. It should be proved by preserved spot of weathering crust of yellow soil (N. Shirinov, 1970). At the same time characteristics of ancient relict soil forming process preserves including high leachingness, weak-acid and acid reaction of soil, ancient gleyiness and loessivage, phylvoacid character of humus substances and the most important - remained allitizationness of the profiles of these soils ( $SiO_2: R_2O_3$  - in clay fraction  $<2,5$ ). Now let's discuss the issue of relict forests' influence on these soils in preserves and evaluate peculiarities of soil changes after relict forests' cutting down and development of soils for agricultural purposes. In the result of scientific research it was defined that mountainous and forest's yellow soils have sufficiently good state of origin, power of soil profile, absence of erodedness which differ them from developed territories. Morphogenetic indicators of soils in preserves are fully of the same descriptions that were shown in previous analysis of V. Akimtzev (1927), R. Kovalev (1996), B. Gasanov (1959, 1983) and others. They have quite powerful profile with surface accumulative humus horizon. Analysis data shows that in preserve conditions humus accumulate mainly in A1 horizon with capacity of 8-10 sm. It is about 11-14 % or 106,2 - 246,2 th/ hect. In the deeper stratum its accumulation became less. Out of preserves, on the territory where for a long period cutting down and pasturing of cattle were held one can observe humic transportation into more deeper horizons. Into A1 (2-10 sm.) here is a 6-8% of humus or 20,5 - 71,7 th/hect. According to another data accumulation of claying, increase of absorbability with enrichment of cation composition by calcium and magnesium, enrichment of humus by humite can be observed out of preserve and in the result of human activity. Yellow podzolic soils form on the crown cover slopy submountain plain which consists of ancient Caspian terrace about 60-100 meters over the sea level. Profile of yellow podzolic soils consists of three zones: 1) A1 and A2 horizons of grey or pale grey colour, good structure, pluffy - firm consistence, high poreness, impoverishmentness of silty-colloid fraction because of intensive enleaching; 2) illuvial horizon B differs by maximal accumulation of fractions; 3) soilforming horizon C is characterized by gradual decrease of clay fraction and by preservice of typical peculiarities of weathering crust of yellow soil. In the Southern Lancaran lowland a special genetic group of yellow gley soils is very typical. They comprise of 20 000 hectares. At the beginning of the 19th century Lancaran lowland with its yellow-gley soils was fully covered by humid subtropical forests. Nevertheless, in the result of intensive human activity forests were destroyed and all these free territories were planted by fruits and vegetables, tea, citrus plants and others. Thanking to the Girkhan State Preserve separate groups of relict rocks survived on yellow gley soils and the extinction of their original types is preserved. Total amount of litter in these forests comprises 5-6 th/hect.

and even 11 th/hectares. The litter is cut, its ash content is 8,6 - 9,7 %. Ashes consists of 1,31-2,04 SiO<sub>2</sub>; 0,11-0,22 Fe<sub>2</sub>O<sub>3</sub>; 0,45-1,41 Al<sub>2</sub>O<sub>3</sub> and 4,04-4,23% CaO. It shows that sufficient presence of ashes in the litter is connected to the high evaporation and feeding of the plants by soil water. Yellow gley soil develops on alluvial deposits. Soilforming process occurs here under special hydrological conditions - soil water is not in depth or even on the surface. In soil profiles it provides intensive gley processes. Gley horizon in the mentioned types of soil can be located on different level of depth. One of the peculiarities of the yellow gley soils is a weak differentiation of soil profile into genethic horizons. So, only humus horizon can be observed. Gley soils contains 72-80% of physical clay. According to B. Gasanov (1958) and R. Kovalev (1966) these territories have a lot of loamy variations of these soils. They appear on alluvial deposits. In comparison with yellow podzolic soils humus locate much deeper by profile. It consists of 5-8% of humus. In upper part of profile under forests' soil there is a 6-8% of humus, in in prolonged land - 2-3%. Contents of nitrogen depends on quantity and distribution of humus by profile. Under forests' in 0-100 sm. layer humus recourses comprise 220-270 th/ hect., in developed lands - 75-230 th/hect. Reaction of the soil environment is weakly acid. Sometimes it's neutral and even alkaline in lower horizons. PH of water suspension is about 6,0 - 8,0. Thanking to the carbonate bulge in lower horizons PH of profile comprise 8,0. In cause of improvement of the agrarian and land-reclamation situation these soils are good for tea plantations, cereals and citric plants. It is a fact that in the result of long utilization of yellow gley soils for plants and application of water and chemicals in land-reclamation one can observe great changes while comparing with vergin origin of these soils. All these data emphasize the necessity to research comprehensively antropology of these soils and to define concrete measures for protection and rational utilisation of the soils under tea and subtropic plants. It was defined that in preserved forests and in another virgin regions of relict forests original types and sub-types of relict forests' soils are existed. These soils are the best producers of rocks of Girkhan's type. They differ by hydro-protection qualities even during moisture deficit period. Here one can observe active natural wood rehabilitation. In summer mass cutting down leads to intensive drying process of new sprout. So, natural renewal out of preserves almost comes to an end. It requires special wood restoration measures. All territories of ex-relict forests should be rehabelitated by necessary land-improving measures. In other to protect and rehabilitate soils and relict forests as well as to organize increasing system of natural resources it is necessary to follow-up urgent decision to be implemented jointly by scientists of Iran and the Azerbaijan Republic.

We recommend:

- to hold large-scale researches (including examination of soil, greens, water and miniral resources of Talysh and of the nearest regions of Iran;
- to create joint maps and recommendations for improving of the environment and rehabilitation of natural resources in whole region.

It will require:

- to set up precise areals of relict soils' dissemination, soils' detailed classification, their quality indications;
- to work out concrete proposals for rational utilization of all kinds of natural resources: lands, water, plants etc.

Great attention should be paid to the protection and restoration of relict forests and bushes. Another measures as well as implementation of new valuable woods should be taken into consideration.

We also recommend to request governing bodies to organize additional preserved areas and reserves aimed at their transformation in the nearest future into the State National Park.

Keywords : natural changes and anthropic changes

Mots clés : changements naturels et anthropiques