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In work ways of the decision of the problem questions connected with the organization of fishery, by carrying out рыбохозяйственной land improvements, working out of plans for development of a fish economy and carrying out of researches under programs of Annals of the nature in reservoirs of especially protected natural territories are discussed.

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REVOLUTION OF LIFE FROM OCEAN TO LAND, INTERACTING WITH GLOBAL ENVIRONMENT

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Revolution of life from ocean to land, interacting with global environment

Origin of life is depended much on the geological history of Earth. According to several literatures, formation of Earth assumed about 4.6 billion years ago (BYA). Primitive Ocean started to absorb atmospheric CO_2 which created lime stone and reduced global warming. First life activity is estimated to begin about 3.8 BYA as the evidence retained as$\delta^{13}C$ abundance in sedimental rock. Microfossil was also found in sedimentary stone formed in 3.5-3.2 BYA. Magnetic field strengthened protection of life development against cosmic rays in 2.8-2.7 BYA so that oxygenic photosynthesis became active in ocean surface, then cyanobacterial activity became also higher which remains as living fossil, stromatolite. Cyanobacterial can generate O_2, fix CO_2 and N_2. Bigger cells of cyanobacteria, named 'heterocysts', can fix N_2, by using carbon sources which were derived from other cells by photosynthesis. Banded iron formed in 2.5-2.0 BYA by oxidation of ferrous iron in sea water and precipitation to the bottom of ocean. Eukaryotes appeared from prokaryotes, cyanobacteria became chloroplast of algae and other organisms to create more O_2, and also anaerobic microorganisms became aerobic to adapt more O_2 in the atmosphere. Such genetic developments are not only horizontal but also vertical or ring wise. Ozone layer was created from excess O_2 in stratospheric zone, and then sea level went down, so that life was landing about 500 million years ago. Geological history and revolution of life indicate adaptation of organisms including soil microorganisms to more oxidative and drier conditions. Fossil soils or Paleosols were developed from sediment about 3.2 BYA after microfossil was found. According to USDA Soil Taxonomy, Entisol formed first and Inceptisol followed. After banded iron formed, Laterite appeared. "Green clay" was also created under anaerobic conditions, although it might be extinguished when O_2 accumulated in the air. During these changes, final product of organic matter was also shifted from methane (CH_4) to carbon dioxide (CO_2).

In present aquatic sediment, however, deeper layer is still anaerobic and ferrous oxide is reduced to ferric iron. In paddy soil, subsurface layer is also anaerobic under reduced conditions, almost no O_2, forming CH_4 and rich of ferric iron with greenish grey color, which would be similar as "green clay". After life landed, more diverse soils were created such as Alfisol and Ultisol and microbial evolutions took places to adapt development of terrestrial ecosystem. Blue-green algae, or cyanobacteria, in marine ecosystem started to adapt high salinity then moving on soil surface, where was much under drier conditions. Cyanobacteria can grow symbiotically with Lichens, *Bryophyta*, and *Pteridophyta*. Cyanobacteria in present can still grow on salt-affected arid soils over the world with special salt-registrant mechanisms, and act as moderators of sever soil environments against large temperature fluctuations and soil evaporations.

After forest formed in Carboniferous (about 360-290 million years ago), organic matter was accumulated more on soil surface, which may enhance heterotrophic and rhizospheric microorganisms. In Tertiary, dry inland and grassland area developed in the huge continents and grass vegetation formed thick root mat and mychorhizal symbiosis between plant root and soil fungi was also developed. Global climate is changing rapidly nowadays due to intensive human activities, and dry lands are also expanding recently especially inner continents. Mychorhizal symbiosis and other plant-microbe systems with endophytic microorganisms have benefits for plant nutrients such as P, Fe, Zn, Cu and water uptakes by plants and increase resistance to root pathogens.

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Тіршілік революциясы ғаламдық қоршаған ортамен байланыса отырып, мұхиттан басталады. Тіршіліктің пайда болуы Жердің геологиялық тарихына байланысты.

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Революция жизни начинается от океана, взаимодействуя с глобальной окружающей средой. Происхождение жизни зависит от геологической истории Земли.