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Carbon cycle and phosphorus cycle

Carbon cycle and phosphorus cycle are two recycling processes of materials in ecosystems. Since carbon and phosphorus can be considered as nutrients, both carbon and phosphorus cycles can be considered as nutritive cycles. The carbon cycle is involved in the recycling of carbon in ecosystems while phosphorus cycle is involved in the recycling of phosphorus. The main difference between carbon and phosphorus cycle is that carbon cycle interacts with the atmosphere whereas phosphorus cycle does not interact with the atmosphere. Therefore, the carbon cycle is a type of gaseous cycling whereas the phosphorus cycling is a type of sedimentary cycling. Key Areas Covered 1. What is Carbon Cycle - Definition, Features, Process 2. What is Phosphorus Cycle - Definition, Features, Process 3. What are the Similarities Between Carbon and Phosphorus Cycle - Outline of Common Features 4. What is the Difference Between Carbon and Phosphorus Cycle - Comparison of Key Differences Key Terms: Carbon Cycle, Carbon Dioxide, Ecosystems, Food Chains, Nutritive Cycles, Phosphates, Phosphorus Cycle What is Carbon Cycle The series of processes that are involved in the interconversion of carbon compounds in the ecosystems are collectively referred to as the carbon cycle. The major reservoirs of carbon are found in oceans and as fossil fuels. Atmospheric carbon dioxide is absorbed by photosynthetic organisms such as plants and algae to produce carbohydrates. This process is called photosynthesis. These carbohydrates pass through food chains; herbivorous animals eat plants for food, and carnivorous animals eat herbivorous animals for food. Both plants and animals release carbon dioxide to the atmosphere as a waste material of cellular respiration. Once these plants and animals are dead, decomposers work on the dead matter and some amount of carbon in dead organisms are released into the atmosphere in the form of carbon dioxide. Ultimately, the rest of the carbon is released to the environment by the combustion of fossil fuels. The carbon cycle is shown in figure 1. Figure 1: Carbon cycle Pollution and deforestation are human activities which disturb the carbon cycle. Moreover, the increased consumption of fossil fuels may cause global warming. The series of processes that are involved in the recycling of phosphorus in the ecosystems are referred to as the phosphorus cycle. Phosphorus can be considered as an important component of living organisms since it is involved in the formation of biological membranes, genetic materials, bones, teeth, and shells. The natural phosphates in rocks are the major reservoirs of phosphorus. These phosphates are dissolved in water and are taken up by plants. Figure 2: Phosphorus Cycle Phosphorus moves through the food chain by forming structures in living organisms. Only a little amount of phosphorus is released to the atmosphere by microbes in the detritus food chains. The atmospheric phosphorus causes acid rains. Similarities Between Carbon and Phosphorus Cycle Carbon cycle and phosphorus cycle are two processes involved in recycling the materials of the ecosystems. Both carbon and phosphorus cycles can be considered as nutritive cycles. Both cycles interact with animals and other nature-related living things in the ecosystem. Both carbon and phosphorus cycle interact with soil and water in the ecosystem. Definition Carbon Cycle: The series of processes by which compounds of carbon are interconverted in the ecosystems are referred to as the carbon cycle. Phosphorus Cycle: The series of processes by which compounds of phosphorus are interconverted in the ecosystems are referred to as the phosphorus cycle. Interaction with Atmosphere Carbon Cycle: Carbon cycle interacts with the atmosphere. Phosphorus Cycle: Phosphorus cycle does not interact with the atmosphere. Speed Carbon Cycle: Carbon cycle is a rapid process. Phosphorus Cycle: Phosphorus cycle is a slow process. Respiration Carbon Cycle: Carbon cycle releases carbon dioxide to the atmosphere by respiration. Phosphorus Cycle: In phosphorus cycle, there is no release of gaseous components to the atmosphere. Cycling Pool Carbon Cycle: The cycling pool of the carbon cycle is present in the atmosphere and hydrosphere. Phosphorus Cycle: The cycling pool of the phosphorus cycle is present in the lithosphere. Type of Cycling Carbon Cycle: The carbon cycle is a type of gaseous cycling. Phosphorus Cycle: The phosphorus cycle is a type of sedimentary cycling. Major Reservoirs Carbon Cycle: The major reservoirs of carbon are the atmosphere, fossil fuels, and oceans. Phosphorus Cycle: The major reservoirs of phosphorus are ferric phosphate and calcium phosphate in rocks. Conclusion Carbon and phosphorus cycles are two series of processes involved in the recycling of nutrients in the ecosystems. Both carbon and phosphorus are important elements in living organisms. The carbon cycle is involved in the recycling of carbon compounds in the ecosystems. The phosphorus cycle is involved in the recycling of phosphorus in the ecosystems. The carbon cycle consists of a significant gaseous phase whereas the phosphorus cycle lacks a significant gaseous phase. Therefore, the main difference between carbon and phosphorus cycle is the amount of gaseous compounds produced by each cycle. Reference: 1."What is The Carbon Cycle?" Tribal Energy and Environmental Information, Available here. Accessed 17 Aug. 2017.2."Phosphorus Cycle." The Environmental Literacy Council, Available here. Accessed 17 Aug. 2017. Image Courtesy: 1. "Carbon cycle-simple diagram" By FischX - own work based on Image:Carbon cycle-simple diagram.gif, Public Domain) via Commons Wikimedia2. "Figure 46 03 07" By CNX OpenStax - (CC BY 4.0) via Commons Wikimedia The main difference between the carbon and phosphorus cycle is that the carbon cycle has its throughout interrelation with the atmosphere, whereas the phosphorus cycle does not have its interrelation with the atmosphere.Carbon Cycle vs. Phosphorus CycleThe carbon cycle is the series in which the number of processes occurs through which carbon compounds are interchanged within the ecosystem, while phosphorus cycle is the series in which several processes occur through which phosphorus compounds are interchanged within the ecosystem. The interaction with the atmosphere occurs in the carbon cycle, whereas the interaction with the atmosphere does not occur in the phosphorus cycle. The carbon considers as the rapidly occurring process in the atmosphere; on the other hand, the phosphorus cycle considers as the slow, occurring process in the atmosphere.By the process of respiration, the carbon cycle discharges carbon dioxide to the environment; on the contrary, there is no discharge of any kind of gaseous components to the environment. In the carbon cycle, its cycling pool is existing in the hydrosphere as well as in the atmosphere; conversely, in the phosphorus cycle, its cycling pool is existing only in the lithosphere. The kind of gaseous cycling is generally considering as the carbon cycle; on the flip side, the kind of sedimentary cycling is generally known as the phosphorus cycle.Variou of the main pools of carbon are oceans, atmosphere, and fossil fuels; on the other hand, some of the chief pools of phosphorus are calcium phosphate, which is present in rocks and ferric phosphate. In the carbon cycle, the atmospheric involvement of carbon by rainfall is considerable; conversely, atmospheric participation of phosphorus in the phosphorus cycle is negligible. Carbon could react with water to produce acid in the carbon cycle; on the flip side, in the phosphorus cycle, the phosphorus cannot react with water to form acid. Carbon rotates as a gas in the atmosphere during the carbon cycle, whereas phosphorus could not cycle in the form of a gas in the atmosphere during the phosphorus cycle. In the carbon cycle, the carbon is going into the plants by their stomata, while in the phosphorus cycle, the phosphorus is taken up to plants by the soil. The gaseous exchange through the carbon cycle is great between organisms and their atmosphere; on the contrary, the gaseous exchange through the phosphorus cycle is considered negligible between organisms and their environment.Comparison ChartCarbon CyclePhosphorus CycleCarbon Cycle generally refers to the sequences in which several processes occur through which carbon compounds are interchanged within the ecosystem.The phosphorus cycle usually refers to the sequences in which several processes occur through which phosphorus compounds are interchanged within the ecosystem, while phosphorus cycle is the series in which several processes occur through which phosphorus compounds are interchanged within the ecosystem. The interaction with the atmosphere occursThe interaction with the atmosphere does not occurSpeedConsiders as the rapidly occurring processConsiders as the slow, occurring processRespirationDischarges carbon dioxide to the environmentNo discharge of any kind of gaseous components to the environmentCycling PoolCycling pool is existing in the hydrosphere as well as in the atmosphereCycling pool is existing only in the lithosphereType of CyclingThe kind of gaseous cycling is generally considering as the carbon cycleThe kind of sedimentary cycling is generally known as the phosphorus cycleMajor ReservoirsThe main pools of carbon are oceans, atmosphere, and fossil fuelsThe chief pools of phosphorus are calcium phosphate which is present in rocks and ferric phosphateAtmospheric InvolvementThe atmospheric involvement of carbon by rainfall is considerableAtmospheric participation of phosphorus is negligibleReaction with WaterCould react with water to produce acidThe phosphorus cannot react with waterAs a Gas in the AtmosphereCarbon rotate as a gas in the atmospherePhosphorus could not cycle in the form of a gas in the atmosphereTaken Up ByThe carbon could go into the plants by their stomataThe phosphorus is taken up to plants by the soilGaseous ExchangeThe gaseous exchange is great between organisms and their atmosphereThe gaseous exchange is considered negligible between organisms and their environmentWhat is the Carbon Cycle?The term carbon is used in the carbon cycle, which generally refers to the site in which several processes occur through which carbon compounds are interchanged within the ecosystem. Various of the main pools of carbon are oceans, atmosphere, and fossil fuels. Carbon is considering the second most plentiful component in our body after the production of water and creates approx — 50 percent of the dry weight of our body. Everything consists of carbon in their molecular structure. In carbon cycle the atmospheric involvement of carbon by rainfall is considerable and the release of carbon dioxide which is then engaged by the organisms which carry out photosynthesis process such as algae and plants to form carbohydrates from carbon dioxide. The production of carbohydrates from carbon dioxide by photosynthetic organisms known as "photosynthesis." The formation of carbohydrate is then passed down through food chains to all the organisms; herbivores eat plants and grass for the food, and herbivores are eaten by carnivores as a food for them. All living organisms release carbon dioxide in the atmosphere as a waste material of their cellular respiration.Additionally, once plants and animals are dead, their body is decomposed by decomposers such as bacteria, and then some amount of carbon is then released to the atmosphere by the decaying process of dead organisms in the form of carbon dioxide. Eventually, due to the burning of fossil fuels, the rest of the carbon is then released to the atmosphere. In the carbon cycle, its cycling pool is existing in the hydrosphere as well as in the atmosphere.The carbon cycle can be disturbed by various human activities such as deforestation and pollution. Besides, the increased level of the burning of fossil fuels can cause global warming in the atmosphere, which causes several diseases in humans like skin infection, eye problems, etc.What is the Phosphorus Cycle?The phosphorus cycle is usually defined as the sequences in which several processes occur through which recycling of phosphorus compounds occurs and interchanged within the ecosystem. Phosphorus is one of the major life-forming compounds, and an important component for all living organisms as phosphorus is involved in the production of genetic materials, shells, bones, teethes, and biological membranes, etc.Some of the chief pools of phosphorus are calcium phosphate, which is naturally present in rocks and ferric phosphate. The calcium phosphate, which is present in rocks, is dissolved in water and then normally uptake by plants.Phosphorus also passes by the food chain through producing living structures of the organisms. Microbes that are present in the detritus food chains release only a little amount of phosphorus into the atmosphere. Atmospheric participation of phosphorus in the phosphorus cycle is negligible, but if atmospheric phosphorus is present in the atmosphere, then it causes acid rain.Phosphorus could not cycle in the form of a gas in the atmosphere. In the phosphorus cycle, its cycling pool is existing only in the lithosphere. The kind of sedimentary cycling is generally known as the phosphorus cycle, so plants take up phosphorus through the soil.Key DifferencesIn the carbon cycle, the numerous processes occur through which carbon compounds are exchanged within the ecosystem, while in the phosphorus cycle, the numerous processes occur through which phosphorus compounds are exchanged within the ecosystem. In the carbon cycle, the collaboration with the atmosphere happens, whereas in the phosphorus cycle, the communication with the atmosphere does not occur.Carbon deliberates as to the fast happening method; on the other hand, phosphorus cycle deliberates as to the slow, going on the method.The carbon cycle releases carbon dioxide to the environment through the method of respiration; on the contrary, there is no release of gaseous constituents to the environment.The cycling pool of the carbon cycle is present in the hydrosphere the same as in the atmosphere; conversely, the cycling pool of the phosphorus cycle is present only in the lithosphere.The specific type of cycling of gases is generally considered as the carbon cycle; on the flip side, the specific kind of sedimentary cycling is normally known as the phosphorus cycle.Many of the chief pools of carbon are oceans, atmosphere, and fossil fuels; on the other hand, many of the main pools of phosphorus are calcium phosphate, which exists in rocks, and ferric phosphate.The atmospheric participation of carbon by the rainfall is significant in the carbon cycle; conversely, in the phosphorus cycle, it is considered as insignificant.Carbon revolves as a significant gas in the atmosphere during the process of the carbon cycle, whereas phosphorus could not rotate in the method of specified gas during the process of the phosphorus cycle.In the carbon cycle, the carbon is entering into the plants by their stomata present on the surface of plants, while in the phosphorus cycle, the phosphorus is occupied to plants through the soil.ConclusionThe above discussion concludes that the carbon recycles the compounds of carbon, while phosphorus recycles compounds of phosphorus. Carbon considers as the rapidly occurring process; on the other hand, the phosphorus cycle considers as the slow, occurring process.

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