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Email- prcbsbi@gmail.com

lnpvns@gmail.com

Website www.philosophical researchcouncil.com

मुद्रक
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प्रकाशक
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पंचविंशतिः पुष्प

Species Co-Existence In Nature

Dr. B.N. Pandey*

Coexistence is living together. Existence of a great biodiversity is itself a testimony of coexistence. There are plenty of examples of peaceful coexistence among various organisms in nature. Populations of plants, animals and microorganisms occur together in an area. They variously interact there and influence each other and establish intra-specific relationship between individuals of same species as well as inter-specific relationship between the individuals of different species.

Both positive and negative interactions are found in nature. In positive interactions, populations help one another and either one or both the species are benefited but neither is harmed e.g. mutualism, proto-cooperation and commensalism. However, in negative interaction one organism derives benefits but the other is harmed e.g. predation, parasitism and amensalism. For the purpose of this paper only the three types of positive interactions have been described with examples.

Mutualism is a way of living where two individuals live together and cooperate each other and both the individuals derive benefit. Pollination and dispersal of fruits and seeds are mutuality beneficial relationship between animals and plants. Plants need animals for pollinating their flowers and dispersal of seeds. Animals in return, obtain food in the form of pollen or nectar. Lichen is an association of a fungus and an alga where fungus provides moisture, minerals and shelter to the alga and the alga provides food to the fungus through photosynthesis. In symbiotic nitrogen fixation, bacteria in root nodules in legumes fix nitrogen from atmosphere for the plant and the plant reciprocate by providing shelter, water and food. Mycorrhiza is an association of plant root and a fungus where fungus helps in absorption of water and minerals from soil and in turn gets food and shelter.

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* Associate Professor, Botany, Government Girls' P.G.College, Ghazipur

In proto-cooperation two species interact with each other with mutual benefit. This is a non-obligatory and temporary association. When they live together both derive benefit but survival is possible in the absence of the interaction. Best example is association of sea anemone and hermit crab. Sea anemone is attached to shells of hermit crab. Sea anemone provides camouflage to hermit crab and in turn is transported to new feeding places.

In commensalism is an association between individuals of different species where only one is benefited and neither is harmed. The two individuals live together without entering in to any kind of physiological exchange and one is benefited without any effect on the other. Some common examples among plants are epiphytes and lianas. Epiphytes are plants like mosses, orchids, ferns etc. that grow on other plants to get better sunlight without causing any harm. Lianas are woody climbers on trees deriving benefit as support without any harm to trees. Among animals commensalism is found between sucker fish and shark. Sucker fish is found attached to sharks with their suckers. Sucker fish gets protection from predators whereas it has no effect on sharks.

It is observed that the benefit may be regarding the food, shelter, substratum or transport. In the interaction, the two partners may be in close contact or one of them may live within a specific area of the other or attached to its surface. The association of the two partners may be continuous (long duration) or transitory (short duration). Further it may be obligatory (cannot survive without the other) or facultative (can survive without the other). However, every interaction exhibits coexistence and it seems coexistence is the law of nature.

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