## 1.11. INTER-RELATIONSHIP BETWEEN THE LIVING WORLD AND THE ENVIRONMENT

There is a close, interactive relationship between the living organisms and the environment. Life is unthinkable without a suitable, sustainable environment. Our planet earth has the proper environment to sustain life. Living organisms also have influence on the environment, particularly an the atmosphere, hydrosphere and lithosphere and *vice versa*. The study of interactions between organism and their physical and biotic environment as known as 'ecology'. The interrelationship between organisms and their environment are based on certain **principles** which are discussed below :

1. Everything influencing the life processes of an organism constitutes its environment.
2. Environment in a habitat may be considered as *biotic* and *abiotic* components and the activities of the organisms are influenced by the combined effects of various environmental factors.
3. An organism is a biotic component of the environment and the materials and energy (light, heat, chemical, potential or free energy etc.) required for the maintenance of the body and sustenance of life of organisms constitute the abiotic environment.

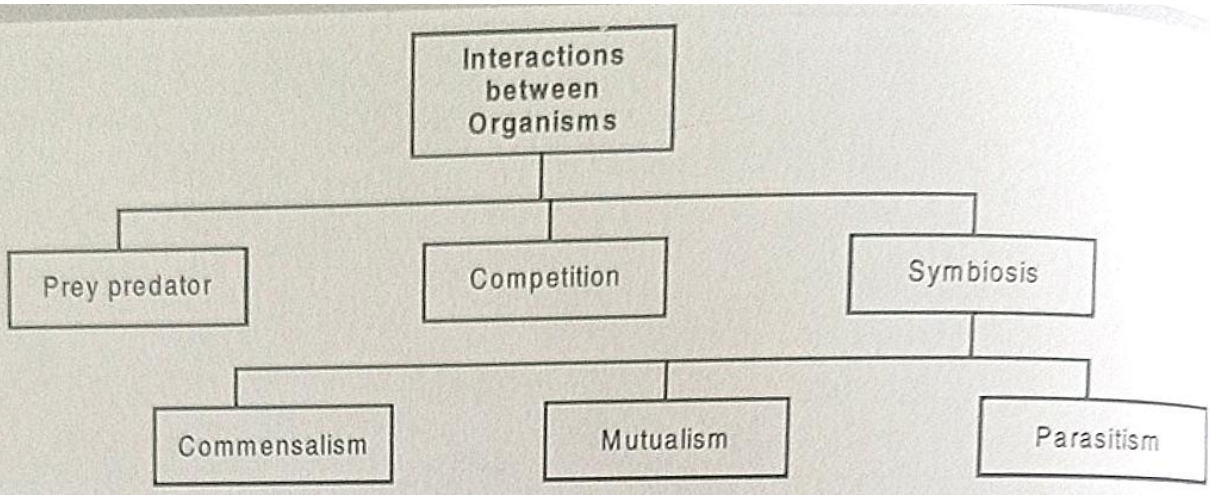


**Fig. 1.30.** Various types of interactions between organisms.

4. An organism cannot exist in vacuum. Hence a suitable environment is required for life to exist.
5. Life is the **energy exchange processes** between the organisms and environment which starts from initiation (birth or germinations) of life and continues upto the death. Death means cessation of the exchange processes of energy.
6. The environmental requirements of different organisms differ from individual to individual and also with age and need.
7. Life activities are influenced by that environmental component which occurs in **minimum quantity**. This is **Liebig's law of limiting factor**. Liebig stated that the growth of a plant is dependent on the amount of the essential nutrient that is supplied to it in minimum quantity.
8. Life activities of an organism are influenced by the minimum or maximum quantity of the environmental components or factors, as for example, nutrients, light, temperature, moisture. Based on this principle **Shelford** founded the **law of tolerance**.
9. **Tolerance limits** of an individual for different environmental factors may be different. An organism may show different tolerance limit for a particular environmental factor in different habitats and at different age and stage of life history. Organisms having wide tolerance limits for many environmental factors are widely distributed.
10. An organism is a product of nature (genetic set-up) and nurtured (environmental upbringing) in the environment. The inherited qualities are unfolded in proper environment.
11. Organisms react with the **external stimuli** caused by the environmental changes. The reactions may be exhibited by movements (migration) or adaptational changes in the body or physiological activities. All such adaptations have survival value.
12. Widely distributed species are adapted to various habitat conditions by evolving **ecotypes**. An ecotype (sometimes called **ecospecies**) is a genetically distinct geographic variety, population or race within a species, which is adapted to specific environmental conditions.