Interdependence between the species essay

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INTERDEPENDENCE BETWEEN THE SPECIES INTERACTION BETWEEN PLANTS AND ANIMALS: Animals are depending upon plants for their food shelter and also for various things. ANIMALS HELP PLANTS IN DIFFERENT WAYS 1. Many animals are involved in the pollination in plants. 2. Fruits and seeds of many plants are dispersed by animals 3. Decomposers convert organic substances into inorganic substances so that plants can absorb them easily. SPECIES INTERACTION All types of relationship between organisms can be divided into two 1)Positive interaction-which is beneficial to one or both partners.

These include a) commensalism b)proto co-operation c) mutualism 2)Negative interaction-which is harmful to one or more of the participants. These include a)competition b)predation c)parasitism d)amensalism and e)antibiosis MUTUALISM-is an association between two or more organisms in which all is mutually benefited without any harm. It can be between plants and animals, different plants and between two animals. 1) Pollination by animals 2) Dispersal of fruits and seeds 3) Association between birds and animals-the cow bird and bison, the oxpecker and antelope, the crow and cattle.

Here the birds get rid of the ticks and external parasites in the body of host and inturn the bird receives a constant supply of food. In the interaction between crocodile and the bird, Pluvianus aegyptius, the bird removes leeches and food fragments from crocodiles jaws. Inturn the bird receives food from the crocodile. Mutualism may be obligatory (where one cannot live without the other eg millions of ciliate protozoa and bacteria in the stomach of horse digest cellulose for the horse and provides 20% of its nitrogen requirement per day.

These micro organisms are essential for the normal growth and health of the horse)or facultative (where both are favoured by living together but one can live without the other eg squirrels facilitate the extension of the hickory tree by burying the nuts. Here the hickory tree can propagate without the squirrel and squirrels can survive without hickory nuts.) The relationship between man and domesticated plants and animals is of obligatory type. SYMBIOSIS – is the association between two organisms which live together in close physiological union for mutual benefit. Similar to obligatory mutualism. Eg. 1) Lichens-association between photosynthetic algae and fungus where the algae manufactures food and the fungus provides moisture and minerals 2) Symbiotic nitrogen fixers-the nitrogen-fixing bacteria present in the root nodules of leguminous plants and other plants which fix atmospheric nitrogen and make it available to plants whereas the bacteria obtain food from the plants. 3) Mycorrhizae-mycorrhizal fungi common in the roots and other tissues of many orchids, which help in absorbing water and nutrients (phosphorous) from the soil.) Zoochlorellae and zooxanthelae-zoochlorellae (photosynthetic algae) and some brown or yellow cells, probably flagellates(zooxanthallae) live in the outer tissues of certain sponges, coelenterates, molluscs and worms produce nitrogenous compounds beneficial to host and in exchange they obtain minerals released by metabolism of host animals. Mutualism and symbiosis are the names given to very similar type of association. COMMENSALISM: -is the association between members of different species without any physiological contact in which only one is benefited and the other is neither harmed or benefited.

The chief benefits of this association are shelter, anchorage, transportation and food supply. A commensal that lives upon the host’s body is called ectocommensal. eg 1.. Lianas: Vascular plants that are rooted to the ground and maintain erectness of their stems by making use of other objects for support. 2. Epiphytes and epizoans: Epiphytes are plants that grow perched on other plants only as support and not for food and water. They are provided with special roots called velamin roots, which can take up water from the moisture. Epizoans are plants that grow on the body of animals.

Eg the green algae grow on the long, grooved hairs of the sloth. Sucker fish attaches itself to the body of a shark. A commensal that lives inside the body of the host is referred to as endocommensal. 1. Some saprophytic fungi and bacteria live within the tissues and cavities of higher plants and animals. Some microbes are seen in the lower intestines of animals. (Here they are not taking anything from the host’s body) 2. Termite nests provide ecologic niches for more than a 100 species of other animals such as ants, beetles and millipeds. 3.

A oyster crab, Pinnothers ostreum is found in the mantle cavity of the oyster. In addition to shelter it also gets food from the host molluscs, oyster without causing any harm. PROTOCOOPERATION :-It is a short step ahead of commensalism and cooperation. In this relationship, both organisms gain by the association and are mutually benefited(facultative mutualism) Eg the Red billed Oxpecker form protocooperation with Black Rhinoceros- the bird feed on the parasites sticking on the skin of the rhinoceros relieving him of the parasites, and inturn obtaining their food.

PREDATION : -In this relationship the prey is killed and eaten by an animal, the predator which is free living and usually larger than its prey. Eg> 1. Herbivore animals that eat plants or seeds of plants area also in a way predators because they remove individuals from the population. 2. Carnivorous or insectivores plants: -Eg Uticularia, Drosera, Dionaea, etc which consume insects and other small animals for their food. 3. Predation between herbivores and carnivores. PARASITISM: -It is relationship between two individuals of different species in which the parasites receives benefit(food, shelter and protection) at the expense of the host.

There are certain modifications and adaptations which might have evolved in these organisms, such as organs of attachment, special body shape, cuticles, loss of locomotory organs, loss of sense organs, digestive systems, etc. 1. Species of Cuscutta(total stem parasites)grow on other plants on which they depend for nourishment. They are provided with specialized roots called haustorium that penetrate the stem of the host establishing relationship with its conducting elements. 2. Tape worm living in the gut of host. . Ticks, mites etc that sucks blood from the body of animals. COMPETITION: – The word competition means striving for the same thing. At the ecological level it holds great relevance when the thing for which two organisms are striving for is not easily available or only in small numbers. Competitions may be of two types 1)intraspecific: occurring between members of the same populations. eg competition between Paramecium caudatum and Paramecium Aurelia where one species eliminate the another.)interspecific: -occurring between populations of different species. Eg. Beetles feeding on stored legume seeds. *Both parties competing will be hampered in some

manner or the other. *At the population level energy flow will be reduced or held in check by the competitive action. AMMENSALISM AND ANTIBIOSIS: – Ammensalism is the site-specific relationship in which one population is inhibited while the other is unaffected. Eg Shading out of certain plants under tall trees. So only shade loving trees can live as ground cover in the forests.

Antibiosis is the complete or partial inhibition or death of one organism by another organism through the production of some substance or environmental conditions as a result of metabolic pathways. Eg. Production of chemicals(antibiotics) that are antagonistic to microbes. Pond blooms of blue-green algae are known to produce toxins(HYDROXYLAMINE) that causes death of fish and cattle. ALLELLOCHEMISTRY OR ALLELOPATHY OR CHEMICAL AGGRESSION It consists of coactions whereby chemicals secreted by one organism affect the growth, health and behaviour of other organisms.

Allelopathy is produced in plants where toxins are liberated that inhibit seedling growth in the vicinity, which affects succession in plant species. Eg. The roots of the forest tree Grevillea in Australia appear to produce water soluble substance that inhibits the establishment of adjacent seedlings of the same species. Pheremons, chemical messages between members of a species are especially important in reproductive behaviour, social regulation and recognition, alarm and defence, territory and trail marking, food location.