

Today, a living creature as parasites have had many years of transition. There are still aliens who are in the parasitic life manner transition period. These are not parasites, although they live in larger living organisms than themselves. There are a few steps in the together life of the organisms. It is not always possible to exactly distinguish between these steps.

In general, a number of terms are useful to the study of parasitology. Animals that live in close association with each other are called symbionts living together in the process of symbiosis. For example, if your's dog or cat has ever had fleas, you have witnessed symbiosis in action. ***The word SYMBIOSIS literally means “ living together”. But we use the word symbiosis in biology or ecology, what we are really talking about is a close, long-term interaction between two different species. In the symbiotic relationship, it is considered that, one organism is accepted a host because it is larger than the other organism.*** Symbiont, which is the term for smaller organism in a symbiotic relationship that lives in or on the host. There are many types of symbiotic relationship that occur in nature.

***One type of symbiotic life is COMMENSALISM that is a class of relationship between two organisms which one organism benefits from the other without affecting it.*** The word commensalisms is derived from the word “ commensal” meaning “eating at the same table” in human social interaction. The species that benefits from the association may obtain nutrients, shelters, support, or locomotion from host species, which is substantially unaffected. Pilot fish ( *Naucrates* spp.) and Remora (*Echeneidae*) are often cited as examples of commensalism. A Remora is a slender fish whose dorsal fin is modified into an adhesive organ, which it attach to large fish, turtles, even submarines. It is probably commensal arrangement as the remova can move arround the host, removing ectoparasites and loose flakes of skin, while benefitng from protection provided by the host. ***Another type on symbiotic life is MUTUALISM that describes a relationship in which both partners benefit from the association.*** Mutuaslism is usually obligatory, since in most case physiological dependent one mutual cannot survive without the other. Bees fly from flowers to flowers gathering nectar, which that make into food beneting bees. When the bee settle on in a flower, the bee gets some pollen on their hairy bodies, and when they settle on the next flower, some of the pollen are given to new flower. In this mutualistic relationship, the bees get to food, and the flowering plants get to reproduce. A cow

eats plant material like hay and grass that is full of cellulose. Cellulose is very hard to digest, so the cow relies on bacteria and other organisms that live inside them to break down the cellulose into a form from which they can extract nutrients. The relationship between a cow and the cellulose digesting bacteria is a symbiotic one, meaning both parties benefit. The cow provides the bacteria a warm, moist environment with a constant supply of food. The bacteria enable the cow to access the nutrients in their cellulose-rich diet and provide a protein source. **Another type on symbiotic life is PHORESIS a small creature is carried by a larger creature.** When the honey bees suck the juice from the flowers, the larva of the Spanish housefly clings ( adheres ) to the body of the bees and is carried to the beekeeper's hive. It is fed there with bee eggs and honey. As you can see here, there is no connection with the bee. It is a very small fish that Fierasfier fishes live in the respiratory system of sea cucumbers, sea stars, mussels and oysters, providing food by eating crustacea from the outside. But when it leaves the place where it is, it is immediately swallowed by other fish. The fish, called Naucrates ductor, feed on shredded food scraps by following their sharks. There are no connections.

**PARASITE, as a rule, is an animal that lives temporary and permanently on or in other living organisms, which is called its host, getting some kind of benefit from it and at the same time doing it some kind of harm. The parasite can not live independently.** Parasitology is the science which deals with parasites. Parasitism is the relationship between parasites and their hosts. Parasitology, the study of parasites and their relationship to their hosts, is one of the most expensively and detailing phases of biology. This discipline actually encompasses several branches to the study among taxonomy, morphology, biology, ecology, epidemiology, pathology, immunology, serology, biochemistry, diagnosis, treatment and programs of control of parasites and parasitic diseases.

## Host - Parasite Relationship Types

**Accidental / random parasitism:** A accidental parasite lives freely in nature, but it lives in a host. *Gordius aquaticus*, that lives freely in the water, is taken with drinking water and after stayed a short time hosts ( human, cattle, sheep ), and then they are thrown out with vomit. *Geophilus ferrugineus* ( centipede ) enters the mouths and noses of people sleeping in the tree shade in the summer months and is thrown out

shortly. In this type of parasitism, there is no real parasitism. The creature that randomly enters an organism is expelled in a short time.

**Facultative ( Optional ) Parasitism:** In some cases, creatures living freely in nature are parasitic with their own wishes. Facultative parasites are not normally parasitic but can become so when they are accidentally eaten or entered a wound or other body orifice. These creatures do not need to live as parasites. In order to pass parasitic life, there must be significant changes the form of life and nutrition of the organism. As an example we can give the flies. The flies live freely, in some cases, they leave their eggs found wound on the skin of animals and humans and the larvae develop there. The larvae of these flies cause the phenomenon called myiasis. The deeper presence of these larvae causes myiasis. From free living leeches, such as *Limnatis nilotica*, sometimes sucks blood from animals such as horse, buffalo, cattle, sheep.

**Obligator (obligatory) parasitism:** This is how real parasitism starts. Living creatures in this group have to spend some or all of their lives as parasites. Most parasites are obligate parasites; that is, they cannot complete their life cycle without spending at least part of the time in a parasitic relationship. Compulsory parasitism is divided into three groups in itself parasites vary in their duration of stay on or in the host.

a ) Permanent parasitism, b ) Temporary ( Intermittent ) parasitism, c ) Periodical (rotational ) parasitism.

Temporary parasitism: The parasitic condition abides for a short or long period depending on the period of time during which the food is taken. There is no period of development of these parasites in the host organism. In temporal parasitism, the relationship between the host and the parasite is a loose parasitism based on a food exchange. The mosquitos take blood for one or two minutes from hosts, but sometimes ticks take blood for 7-8 weeks from hosts.

Permanent parasitism: True parasites are in this group. There is no period of development of these parasites in nature. They have to spend all their lives on or in the hosts. In this type of parasitism, various types of permanent parasitism are seen with regard to life style of the parasites.

A) There are no free living periods in the life of the parasites which are parasitic creatures continuousing in period without changing the host, and one of the best examples is scabies from arthropoda. If there is no external interference, the scabies live in the tünel here, digging through the depths of the human and animal skin. The larvae that grow out of the eggs the females leave here come to more superficial

places. Female and male scabies come to the scene. The female scabies go back deep and produce eggs. This process continues for generations. Until treatment, the effects of scabies remain constant.

B) Continuing parasitism by changing the host: There are no free living periods of parasites in the nature. The host changed depending on their biology. This is seen in many protozoa. Malaria disease is produced by *Plasmodiums* agents which continue their life between people or animal and mosquitoes without moving freely in nature, these parasites develops asexual in humans, sexual development is observed in mosquitoes.

C) From a generation of the host to the other generation: This is called transovarian parasitism. The female hosts transmit the parasites to their new generations. Some agents of the diseases enter the eggs of female insects or female ticks and thus transmitted to the next generation. *Babesia* are intraerythrocytic parasites of domestic animals and are the cause of anaemia and haemoglobinuria. They are transmitted by ticks in which the *protozoan* passes transovarially ( parasite agents passed trough the eggs of ticks ), via egg, from one tick generation to the next. *Babesia ovis* can infect the fourteen generation of *Rhipicephalus bursa*.

#### Periodical parasitism:

A) Occurrence (in rotation) of parasitic and free generations: A generation is a parasite and a generation lives free in nature. The best examples are the species in *Strongyloididae* family. *Strongyloides* is unique among the nematodes of veterinary importance being capable of both parasitic and free-living reproductive cycles. The parasitic phase is composed entirely of female worms in the small intestine and these produce larvated eggs by parthenogenesis, ie. development from an unfertilised egg. After hatching, larvae may develop through four larval stage into free-living adult male and female worms and this can be followed by a succession of free-living generations. However under trouble conditions such as high or low temperature and long rainless, L3 (larva3) can become parasitic infecting host, to develop into adult female worms in the small intestine.

B) Protelien parasitism (young form parasite, adult form free): While the larvae are parasites, the adults are free in nature. We can exemplify the free living flies in the nature. When adult flies fly freely in nature, some of them must go through a mammalian animal larvae period. *Hypoderma bovis* females adhere their eggs to the hairs on legs and ridge of cattle. The eggs hatch spontaneously in less than 1 week,

and the larvae burrow through the skin set off on prolonged migrations through the connective tissue of their host. When fully developed the larvae enlarge their breathing holes, emerge through them, and then adult flies emerge from pupal cases about one month later. Hence, they cause great economic loss by making holes into the skin. In particular, *Hypoderma bovis*, which is known as nokra, büvelek, destroys the skin of cattle, is very important in the cattle production.

C) Imagonal parasitism (adult form parasite, young from free): Many species in the *Nematoda* class, which cause significant parasitic diseases in humans and animals, constitute this type of parasitism. This is related to biology and show some changes. In the genus and species of the *Trichostrongylidae* family, parasites has a direct life cycle. The eggs are passed in the feces and the larvae are found on the herbage in nature. Adult parasites are found in digestive systems in cattle, sheep, goats.

The parasites are found in *Ancylostomatidae* such as *Ancylostoma* spp. and *Necator* spp., caused hookworm diseases in humans, dogs and cats. The eggs of parasites are passed in feces and larvae are found on the soil, while adult hookworms are found in small intestine in dogs and cats.

D) Reversal of parasitism during a period of biological development: A periodic parasite is an obligate parasite, it comes to it's host periodically get to the nutrients. This situation is seen on the ticks. Ticks must suck to blood after each development period. This process is repeated in three developmental periods such as larva, nymph and mature periods.

**Specific parasitism:** Parasites can not survive in a host and in organ outside certain host and organ. It is special to host and organ. *Taenia saginata* and *Taenia solium* are special tapeworms for human. Likewise, *Enterobius vermicularis* is a special parasite for human. *Taenia* species live in small intestine while the second parasite lives in the large intestines. *Wuchereria bancrofti*, which lives in human's lymph vessels and cause elephantiasis, can not survive in other hosts or organs.

**Erratic Parasitism:** A parasite is found in another organ or tissue that is normally found in the organ. It is possible to encounter *Fasciola hepatica* and *F. gigantica*, where the normally living place is in bile ducts of the liver. They are found in subcutaneous places, lungs, diaphragm and wall of the vena porta in humans and animals. *Ascaris lumbricoides* normally live in human's small intestine. In some cases, this parasite is also found biliary tracts.

**Egare Parasitism:** This parasitism mean that a parasite is found in another host than which should be normally found in host. *Dipylidium caninum*, a tapeworm of dogs, is sometimes found in humans.

**Hyperparasitism:** This parasitism mean that a parasitic organism is infected by another parasite. This type of parasitism is more common in arthropods living as ectoparasites. The ticks are fed by sucking blood from many domestic animals and human. In the meantime, species belonging to the *Babesidae* family live as parasites in ticks and transfer the agents of babesiosis to another host as sucking blood. *Plasmodium*, malaria factors in mosquitoes, is found parasites in mosquitoes. *Nosema helminthorum* from the *Microsporidae* is found as parasites in the species of *Moniezia* which lives in small intestine of ruminants.

**Superparasitism:** The parasitism mean that a host infected with a parasite species may be infected again with this parasite. A large numbers of a parasite indicate that the host can be re-infected with the same parasite at different times. Infected host with an ascarid type of parasite can be infected again with the same type of ascarid. This situation is seen in many other parasites.

**Multiparasitism:** A host can be infected with many parasitic species at the same time. Multiparasitism is also called the mix infection. This is usually the case in many country. It is possible to encounter 5 to 6 types of parasites at the same time in humans and animals. For example, in the case of human with ascariasis in their intestines, tapeworms and protozoa are common at the same time. At the same time, ruminants may be infected with lung worms, distomatosis ( *Fasciola spp.*, *Dicrocoelium spp.* ) agents, gastrointestinal hairworms and, hydatid cysts, coccidiosis agents in the intestines and many other parasite

**Pseudoparasitism:** There are a number of structures that closely resemble parasites or developing forms, but in reality are not. These structures, referred to as artifacts and confusers, are found primarily in stool and blood samples. Such stool artifacts and confusers may be result of disease processes, medications, and/or dietary habits. Artifacts and confusers, such as stain precipitate, red blood cell abnormalities, air bubbles, pollen grains, hair, plant fibers, fat droplets, mushroom spores and yeast spores may be seen on prepreates.

Accidental ingestion of parasite forms in which humans and animals are not part of their life cycle may also yield confused. Identification of pseudoparasites may occasionally shed light on the host's recent dietary adventure. In faecal examinations,

macroscopic or microscopic objects can be compared to parasite. This is especially the case when the indigestible parts of the food items that were eaten the night before. In fact, it is possible to encounter eggs and larvae of some parasites that are not parasites in their faeces. Distomatosis ( *Fasciola spp.* , *Dicrocoelium spp.*) is very common in the liver of especially domestic slaughter animals such as cattle, sheep, goat. Eggs of these trematodes are encountered in the feces of the liver-eating human and animals such as cats and dogs. It is possible to encounter the larvae of the nematodes that make the hair follicles of the sheep in the stools of cats and dogs fed with the lungs. This situation is misleading and causes misdiagnosis and treatment. Suppose, for example, that we find *Monezia expansa* eggs in a dog feces. We know then that the dog has recently eaten sheep intestine or feces because *M. expansa* is a parasite of sheep and never of dogs.