

Family : Sarcocystidae

This family is divided into 2 sub-families.

1. Toxoplasmatinae
2. Sarcocystinae

Genus: *Sarcocystis*

This is a cyst forming isosporan coccidian under the family Sarcocystidae. This family is different from Eimeriidae family. Life cycle for sarcocystis is indirect, involvement of 2 host. In intermediate host, development of asexual stages occur and in another host, i.e. definitive host, sexual stage development is seen.

Each intermediate host may have one or more species for which the definitive host may be from canine, feline or primate.

Sarcocystis is a Greek word, Sarkos=Flesh, Kysis=Bladder. Sarcocysts are terminal asexual stage found encysted in striated muscles of mammals, birds and poikilothermic animals (IH). They may also be found in CNS and in Purkinje fibre of heart. They are found in different types of myofibres. Sarcocysts vary in different shape and size depending upon the species of Parasite.. They are either microscopic (*S.cruzi*, cattle- dog cycle) or macroscopic (*S.fusiformis* of buffalo- cat cycle.). Macroscopic sarcocysts are found in the skeletal muscle of the oesophageal muscle and appear as filamentous, spindle or rice-grain like. Micro-sarcocysts vary from long and narrow to short and wide. Sarcocysts are always found in parasitophorous vacuole in the host cell cytoplasm. These consist of a cyst wall surrounding the parasitic merontozoite stage. Immature sarcocysts contain globular parasite called merontocytes. Each merontocyte produces two progeny by internal process of endodyogeny producing banana shaped zoites called bradyzoites. Merontocytes are located in the cortex whereas bradyzoites are located in the medulla of the cyst.

Species of *Sarcocystis* are generally more host specific in case of their intermediate host than their definitive host.

Life cycle:

The definitive host gets infection by ingesting the muscular or neural tissues containing mature sarcocyst. Bradyzoites are liberated in the stomach and intestine. Bradyzoites penetrate to the intestine, transforming to macro and microgamont. After fertilization, a wall develops around the zygote and the oocyst is formed. Sporulation of oocyst occurs inside the host in lamina propria. Sporulated oocyst comes out with faeces.

Intermediate host become infected with ingestion of sporocysts during grazing on infected pasture or through infected feed and water with faeces of dog, cat or man containing sporocyst. On reaching intestine, sporozoite released. They penetrate the intestinal wall and reached to mesenteric lymph node and arteries. 1st generation schizonts developed in the endothelial cells of small blood vessels in various organs. All species infecting herbivores from 2nd generation schizonts in vascular endothelium of different organs/tissues, brain, spinal cord. 2nd generation schizonts are mostly responsible for pathogenic effect. So effect of sarcocysts in intermediate host is more than definitive host.

Infection in final host occur by ingestion of muscle cysts containing bradyzoites.

Sarcocysts. of cattle

1. *Sarcocystis cruzi* (Syn: *S. bovi canis*)
2. *S. hominis* (*S. bovi hominis*)
3. *S. bovifelis*: cat and feral cat act as IH.

S. cruzi :

Most pathogenic spp. in cattle. Dog, wolves, coyotes, fox serve as DH and shed sporulated oocyst or sporocyst in their faeces. Following ingestion of sporulated oocyst forms by cattle, 2 or more generation of schizonts occur in vascular endothelial cells, merozoites are found in the striated musculature 1 month after infection and fully formed muscle cysts are evident within 2 ½- 3 months. Acute disease occurred in calves experimentally infected with materials from dog faeces. Clinical signs include anorexia, pyrexia, anaemia and loss of weight. Mortality was produced in 33 days by feeding 10^5 - 10^6 sporocyst. At post mortem, generalized lymphadenopathy was evident.

Dalmeny Disease in Canadian cattle is caused by schizogony of this *Sarcocystis*. Intermittant pyrexia reduced milk yield, loss of condition and dyspnoea. Chronic illness is characterised by emaciation, submandibular oedema and exophthalmia. Schizonts are found in endothelial cells of almost all organs including myocardium. Abortion is common.

S. hominis: Man, rhesus monkey, baboon and chimpanzee act as DH. Ox act as IH.

Sarcocystis in sheep:

1. *S. ovis*: is highly pathogenic for lambs. Animal may be weak and die. Abortion takes place and become anaemic. There is loss of body weight. *S. ovis* have not been found in the fetus, placenta or uterine tissues.
2. *S. tenella*: Non- pathogenic.

Sarcocystis in swine:

1. *S. miescheriana*: has dog- pig cycle
2. *S. porcifelis* -cat-pig cycle
3. *S. porcihominis*- human-pig cycle

Sarcocystis infection is quite common in pig.

Sarcocystis of man:

1. *S. hominis*
2. *S. porcihominis*
3. *S. lindemanni*

Man is the final host for *S. hominis* and *S. porcihominis* and Man is the IH for .

Sarcocystis of other animal

S. cuniculi: Striated and heart muscle of domestic rabbit.

S. muris: occurs in cat and IH are horse, mouse and various spp. of rat.