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Helminthes Infection of Poultry and its Sustainable Control

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Poultry rearing gives pleasure as well as profit to the farmer. In India, poultry farming has now emerged as an important activity and is one of the fastest growing segments of Agricultural sector. The poultry sector is playing a significant role not only in providing the nutritional need of the people, but is also a potent source of employment generation on a large scale particularly for the weaker section, small and marginal farmers and landless laborers. Now a days, farmer faced with unpleasant fact that disease has become a serious menace to the poultry industry. The average poultry keeper usually woefully ignorant of disease. Some common parasitic diseases play an important role in economic losses of poultry industry. Disease caused by parasitic agents are frequently complex and depends upon the method of rearing system, characteristics of host, parasite and environmental condition of the farm as well as the number, type and the virulence of the parasite and the route of the entry to the body. The paper discussed about some most important parasites of poultry.

Nematodes:

Worms are usually not a major cause of disease or economic loss, because rearing of bird inside a building prevent their contact with intermediate hosts. Mostly round worm constitute the most important group of worm of poultry. The number of species, the number of bird infected and the amount of damage done, they far exceed the treamatodes and cestodes. Among all poultry nematodes species of genera *Ascaridia, Heterakis, Capillaria* and *Syngamus* (gape worm) are generally the most common nematodes encountered in poultry. Other nematode species namely *Subulura , Oxyspirura, Strongyloides, Trichostrongylus, Gongylonema ,Tetrameres* are also encountered in Poultry. *Ascaridia galli* is the largest roundworm of bird. Adult parasite lives in the lumen of the small intestine. Earth worms may ingest the eggs and when they are swallowed by the birds, transmit the infection mechanically. They mostly cause loss of body condition, reduced weight gain and feed efficacy. In severe infection there may be blockade of intestine, loss of blood and enteritis. Older birds are resistant to infection. *Heterakis gallinarum* is found in the caecum of poultry. It is not much harmful, but it plays a role in spreading of Histomoniasis caused by *Histomonas meleagridis* – a protozoal disease known as black head disease or entero-hepatitis of turkey.

Subulura brumpti ,commonly called 'pin worm of fowl' occur in fowl, turkey and other birds. Infection of birds occurs by ingestion of cockroach and beetles. This parasite is not so pathogenic unless in very heavy infection.

Capillaria and *Syngamus* can produce significant growth depression and mortality in birds. *Capillaria* are the smallest nematode of poultry. Harmful species of bird is *Capillaria obsignata* found in small intestine and caecum. It causes emaciation, loss of weight, diarrhoea, haemorrhagic enteritis and death. The 'gapeworm' or ';forked worm' *Syngamus trachea* inhabits the trachea and lungs of many domestic and various wild birds. Infection may occur directly by ingestion of infective eggs or larvae; however, severe field infection is associated with ingestion of transport hosts such as earthworms, snails, slugs, and arthropods (eg, flies). Although gapeworms are not a bm .gtproblem in confinement-reared poultry, they cause serious economic losses in game-farm pens and in range-reared chickens, pheasants, turkeys, and peacocks.

Eggs of *Oxyspirura mansoni*, Manson eyeworm, are deposited in the eye, reach the pharynx via the nasolacrimal duct, are swallowed, passed in the feces, and ingested by the Surinam cockroach, *Pycnoscelus surinamensis*. Larvae reach the infective stage in the cockroach. When infected intermediate hosts are eaten, liberated larvae migrate up the esophagus to the mouth and then through the nasolacrimal duct to the eye, where the cycle is completed. Other insect species may also serve as the intermediate host. The parasite causes various degrees of inflammation, lacrimation, corneal opacity, and disturbed vision.

Tetrameres mohtedi –the only species found in Indian fowl.Mature female worms are spherical in shape, blood red in colour. Males are slender with their cuticle armed with four rows of spines. Female lie inside the gland and males are found free in the lumen of the proventriculus .Birds pick up infection by ingestion of Cockroach and grasshoppers .The female worms suck blood and cause marked irritation and inflammation of the proventriculus .In heavy infection, bird may die due to anaemia and emaciation.

Bhalfilaria ladami –'heart worm' of fowl is also found in India.

Treamatodes

Over 500 species of trematodes have been reported from birds, some 20 are considered to be potentially dangerous to poultry . One of the most pathogenic and frequently found poultry treamtode is *Prostogonimus*. Water snail and nymphal stages of various species of dragonflies act as first and second intermediate host respectively This parasite is found in bursa of fabricious, oviduct and posterior portion of small intestine. The infection of this parasite drastically reduces egg production. It also causes abnormal egg production, infected bird lay soft shell egg or egg without shell. The bird become listless, the abdomen is pendulous. Affected bird sits on their nests. Legs of the bird held wide apart. Comb and wattle of infected bird become cyanotic.

Cestodes:

Most species of cestodes seem to cause little pathology of economic importance, especially with infection of only a few hundred worms. All poultry cestodes require intermediate host. All tapeworms of poultry are found in the small intestine. Bird reared in free range system is more infected with tapeworm. Most pathogenic cestode of poultry is *Davainea proglottina* occurs in duodenum of fowl, pigeon and other gallinaceous birds.Adults are microscopic and gastropod molluscs act as intermediate host. This parasite penetrate the intestinal mucosa. In heavy infection, they cause hemorrhagic enteritis and necrosis and this may lead to death of the bird. Genus *Raillietina* is the common tapeworm of poultry. Different species under this genus are namely *R.tetragona, R.echinobothridia* and *R. cesticillus .Raillietina echinobothridia* is the second most pathogenic tapeworm of poultry causing extensive nodule formation at the site of attachment of scolex in the small intestine. Birds pick up infection by injestion of infected ants. In *Davainea proglottina* and

Raillietina tetragona infection decreases weight grain and egg production of bird which has been documented following experimental infection . Other cestodes namely *Cotugnia digonopora*, *Amoebotaenia cuneata* and *Choantaenia infundibulum* are also recorded from birds

Common Helminths of Poultry

Parasite	Host	Intermediate Host or Life Cycle	Organ Infected	Pathogenicity
Nematodes				
Ascaridia galli	Chicken, turkey, duck, quail	Direct	Small intestine	Moderate
Capillaria caudinflata	Chicken, turkey, duck, game birds, pigeon	Earthworms	Small intestine	Moderate to severe
Capillaria contorta	Chicken, turkey, duck, game birds	None or earthworms	Mouth, esophagus, crop	Severe
Capillaria obsignata	Chicken, turkey, goose, pigeon, quail	Direct	Small intestine, ceca	Severe
Cheilospirura hamulosa	Chicken, turkey, game birds	Grasshoppers, beetles	Gizzard	Moderate
Gongylonema ingluvicola	Chicken, game birds	Beetles, cockroaches	Crop, esophagus, proventriculus	Mild
Heterakis gallinarum	Chicken, turkey, duck, game birds	Direct	Ceca	Mild, but transmits agent of histomoniasis
Heterakis	Quail, duck,	Direct	Ceca	Severe

isolonche	pheasant			
Oxyspirura mansoni	Chicken, turkey, guinea fowl, quail	Cockroaches	Eye	Moderate
Subulura brumpti	Chicken, turkey, duck, game birds	Earwigs, grasshoppers, beetles, cockroaches	Ceca	Mild
Syngamus trachea	Chicken, turkey, pheasant, quail	None or earthworm	Trachea	Severe
Tetrameres Americana	Chicken, turkey, duck, game birds, pigeon	Grass-hoppers, cockroaches	Proventriculus	Moderate to severe
Trichostrongylus tenuis	Chicken, turkey, duck, game birds, pigeon	Direct	Ceca	Severe
Cestodes				
Choanotaenia infundibulum	Chicken	House flies	Upper intestine	Moderate
Davainea proglottina	Chicken	Slugs, snails	Duodenum	Severe
Raillietina cesticillus	Chicken	Beetles	Duodenum, jejunum	Mild
Raillietina echinobothrida	Chicken	Ants	Lower intestine	Severe, nodules
Raillietina tetragona	Chicken	Ants	Lower intestine	Severe

Diagnosis

A reliable diagnosis can be made only by accurate identification of the individually recovered parasites; careful and complete necropsy techniques are essential. Only by specific recognition of the parasite can meaningful recommendations for flock therapy and management.Faecal examination as well as mucosal scrapings should be examined microscopically.

Control Measure:

Control of either class requires accurate species identification and knowledge of the parasite's lifecycle. Control of worms with indirect lifecycles may require both control in the main and intermediate hosts. As with most diseases, prevention is better than cure. Effective treatment of parasitic diseases through medication is not available. So managemental practices is the only means to control the parasitic diseases of poultry. For this, breaking the life cycle of parasite by preventing the bird from coming in contact with the intermediate host or transport host. Insecticides may be used for flies and ants and metaldehyde bait for slugs. Beetles, earthworms and crustacean are more difficult to control but alteration of ranges may be helpful. Good sanitation such as proper disposal of excreta, proper disinfection of utensil, cleaning out of contaminated litter, restriction on movement of equipment and personnel also helps to reduce the parasitic infection. Bird of different age should not be kept in close proximity. Proper ventilation and improve watering system also helps in control of parasitic diseases. Worms that are transmitted through the oral-faecal route can be greatly reduced by housing the birds on clean wire away from their droppings. In floor-based housing systems stocking rates, shed cleanout and litter and range management are important factors. Besides these control measures chemotherapy in the form of anthelmintic and insecticide have been the main strategy for prevention and control. Residues in eggs, meat or other edible poultry products are of special concerned. So care must be used to follow direction and withdrawal time. A mixture of phenothiazine and Piperazine @1g of 7:1 will remove 90% or more *Heterakis* and *Ascaridia* infection .Several salts of Piperazine are highly effective against *A.galli* .Piperazine at a dose rate of 300-440 mg /kg in the feed is 94-100%efficient. Piperazine citrate @440mg per litter of water for 24 hrs have similar efficacy.Niclosamide, Hexachlorophene and Praziquantel are effective against cestode infection.