Medical Parasitology
Fall 2016
Study Guide
EEB 3895-Exam 2

Phylum Apicomplexa cont'd

(Class Conoidasida)- major differences in life-cycles of members of this class and the Aconooidasida; 3 species of concern (i.e., Cyclospora cayatensis, Cryptosporidium parvum, and Toxoplasma gondii): for first 2 of these: monoxenous, disease caused, symptoms, diagnosis of infection, how infection transmitted, basic pathology in immunecompetent and immune-compromised individuals. Toxoplasma gondii: facultatively heteroxenous (what does that mean?), life-cycle (understand terminology of life stages: zoitocysts, bradyzoites, etc., site of gametogony, merogony, and sporogony), role humans play in life-cycle and how they acquire infection, typical definitive and intermediate hosts, sites occupied within each host, disease caused and its pathology (towards foetus, adults, etc.), acute vs. chronic phases of disease, (in immuno- competent and immuno-compromised individuals, prevention of infection, diagnosis of infection.

Phylum Platyhelminthes: general features of the phylum (e.g., flat, acoelomate, etc.), configuration of digestive system (if present). Configuration of outer layer of body (neodermis) in species that parasitize vertebrates at some time in life. Most, but not all are monoecious (hermaphroditic). NOTE: We will have covered the following 11 species of platyhelminths for this exam: *Fasciola hepatica*, *Fasciolopsis buski*, *Clonorchis sinensis*, *Paragonimus westermani*, *Schistosoma mansoni*, *Schistosoma japonicum*, *Schistosoma haematobium*, *Taenia solium, Taenia saginata*, *Echinococcus granulosus*, and *Diphyllobothrium latum*.

Subclass Digenea: general features, generalized life-cycle (larval stages, sequence and their general host associations), life-cycle stages found in all digeneans; 3 general strategies for minimizing impact of hazards associated with transfer between hosts (high fecundity, polyembryony [what is it and where does it occur in digenean life-cycles?], host manipulation hypothesis.

Liver flukes: for each of 3 species know: site in definitive host (note that site in host of Fasciolopsis buski is an exception), general geographic distribution, whether zoonotic infection, hosts, diseases caused, pathogenicity in humans, epidemiology, how to diagnosis infection in definitive host, including morphology of diagnostic stage, understand paths juveniles take to and eggs take away from liver in definitive host, stage infective to each host, treatment (if covered), how infection is acquired; how to prevent infection. Life-cycle of *Fasciola hepatica*. Life-cycle of *Clonorchis sinensis*; special behavior of cercariae of *C. sinensis* that maximizes chances of encountering second intermediate host.

Lung flukes: *Paragonimus westermani*: site in definitive host, general geographic distribution, whether zoonotic, hosts, disease caused, pathogenicity in humans (from juveniles; from adults), epidemiology, how to diagnosis infection in definitive host, including morphology of diagnostic stage, understand path juveniles take to and eggs take away from lungs in definitive host, stage infective to each host, treatment, how infection is acquired; how to prevent infection. Life-cycle.

Blood flukes: dioecy, physical relationship between males and females, gynecophoral canal-what is it? 3 primary species of *Schistosoma* in humans; for each know: general geographic distribution, site in definitive host, how to diagnosis infection in definitive host, including morphology of diagnostic stage, stage infective to each host, zoonosis or not, egg morphology, strategy employed by schistosomula and adults to avoid host immune response; details of pathogenicity of infection (i.e., of 3 phases/stages of disease); granuloma and pseudotubercle formation; mechanism by which eggs exit vasculature and definitive host; life-cycle of Schistosoma mansoni as an example of a schistosome life-cycle. Four strategies of control of Schistosomiasis and associated problems. Bird schistosomes- disease caused in humans, stage causing disease and explanation for pathology.

Subclass Eucestoda (i.e., tapeworms): unusual features relative to other platyhelminths (lack of gut, microtriches, etc.), basic eucestode morphology (scolex, etc.), what is a proglottid? Three ages of proglottids. Larval stage (first) found in ALL eucestodes (i.e., hexacanth), differences between protective layers seen in terrestrial versus aquatic species. *Taenia saginata*: Adults: disease cased, zoonotic?, site in definitive host, approximate size, diagnosis, pathology, stage infective to definitive host, epidemiology, distribution, treatment; cysticerci: hosts, zoonotic?, site(s) in intermediate host. *Taenia solium*: Adults: disease caused, zoonotic?, site in definitive host, approximate size, diagnosis, pathology, epidemiology, stage infective to definitive host, distribution, treatment; cysticerci: hosts, disease caused, zoonotic? (role humans play in life-cycle), site(s) in intermediate host, pathology, epidemiology, stage infective to human (2 different ways humans can become infected with cysticerci), diagnosis, treatment; note human both definitive and intermediate host. *Echinococcus granuluosus*: Adults: size, definitive host(s), zoonotic?, distribution; hydatid cysts: hosts, disease caused, zoonotic? (role humans play in life-cycle), site(s) in intermediate host, basic morphology of hydatid, polyembryony, pathology if hydatid breaks open, pathology if hydatid intact, epidemiology, stage infective to human, diagnosis, treatment; note human just intermediate host. Distinction between sylvatic and urban life-cycle; approximately how many adult worms results from consumption of one hydatid cyst? *Diphyllobothrium latum*: approximate size (over 10 meters), natural definitive host(s), zoonotic? Role humans play in life-cycle, second intermediate host (we didn't talk about the first), how do humans become infected (infective stage), distribution.

Remember that, with the exception of *Taenia solium*, metazoan parasites do not increase the number of individuals within a host and thus the terms prevalence (percentage of individuals infected) and intensity (average number of individuals of a parasite in infected hosts) apply.