ACTA PARASITOLOGICA

ISSN 1230-2821

European Federation of Parasitologists

ABSTRACTS: VIII EUROPEAN MULTICOLLOQUIUM OF PARASITOLOGY

Witold Stefański Institute of Parasitology
Warszawa, Poland
removing three preparations (Bullcock, Factac and Rasudin) the mortality ranged from 30% to 60% and it depended on the species and concentration. These non-specific chemicals caused also a nearly 100% mortality of plant louse and leaf-feeding insect larvae whereas the bioinsecticide Bacillus (spore and delta-endotoxins of B. t. kurstaki) affected only lepidopterous larvae.

Conclusions: Tested crystalliferous entomopathogenic B. thuringiensis preparations as highly specific microbiological agents were not active against snail vector in contrary to known molluscidial strains Bacillus brevis which have been already applied in biological control against the schistosomiasis vectors.

Molluscs as intermediate hosts of ruminant parasites
M. Y. Manga-González
Consejo Superior de Investigaciones Científicas, León, Spain

Objectives: To review the phylum Mollusca species involved in the life cycle of the main Digenea (Fascioloidea, Paramphistomatoidea, Schistosomatidae, Dicrocoeliidae) and Nematoda (Prostomorchiidae) parasites of ruminant definitive hosts (DH).

Methods: Our own natural and experimental infection data in intermediate host (IH) molluscs of Fasciolo hepatica, Dicrocoelium dendriticum and Prostomorchiidae sp. are summarized. Information from other authors is also reviewed.

Results: The ruminant parasite IH molluscs mainly belong to class Gastropoda, subclass Pulmonata, orders Basommatophora (Lymnaeacea and Planorbacea) and Stylommatophora (Architaeniidae, Arioidae, Brodskyamidae, Cochlicepidae, Chondriidae, Eulimidae, Helicidae, Pomatiidae, Patellidae and Zoniidae). The Digenea multiply hugely inside the molluscs. Numerous cercariae, which develop in sporocysts (Schistosomatidae, Dicrocoeliidae) or rediae (Fascioloidea, Paramphistomatoidea) are produced from only one miracidium and will abandon the mollusc either to penetrate the DH (Schistosomatidae) or to become metacercariae in the external environment and be ingested by the DH (Fascioloidea, Paramphistomatoidea). The cercariae of Dicrocoelium leave the mollusc in the slime balls which are then ingested by the second IH, ants. Prostomorchiidae larvae (L) do not reproduce inside the molluscs, although they evolve from L-1 to L-3, the infective stage for definitive hosts.

Conclusions: Basommatophora molluscs are indispensable in the transmission of Schistosomatidae, Fascioloidea and Prostomorchiidae and those of Stylommatophora in that of Dicrocoeliidae and Prostomorchiidae.

Influence of the biotic factors on the vector molluscs of schistosomiasis
H. Moné, G. Mouahid
Université de Perpignan, Perpignan Cedex, France

The aim of this review is to emphasize the importance and the diversity of the influences exerted by the biotic factors on the biology and ecology of the vector molluscs of schistosomiasis. The following biotic factors will be considered: the schistosome itself, molluscs that are non-vectors of schistosomes, and competitor parasites. Each of these biotic factors exert influences on the vector mollusc biological functions (relation, nutrition and reproduction). Relation functions are those which permit the vector molluscs to feel and respond to the environment; for instance, aggregation of the vector molluscs is a behavioral answer to the presence of the schistosome. The functions of nutrition are those which permit the vector molluscs to grow and survive in the environment; for instance, the presence of non-vector molluscs provokes an enhance in the growth of the vector molluscs. Reproduction is also affected; for instance, some bird or rodent parasites, called echinostomes, are responsible for the castration of the vector molluscs. The influences exerted on the vector molluscs may favor (aggregation, better growth, etc.) or, inversely, may affect (castration, etc.) transmission to the vertebrate host. The enhanced transmission of schistosomiasis due to human activities such as dam constructions has made more necessary the knowledge of these antagonistic influences exerted by the biotic factors on the vector molluscs in the view of vector control.

The characteristics of Fasciola hepatica larval development in Lymnaea truncatula varied with the origin of the definitive host
D. Rondelaud, G. Dreyfuss
Faculté de Médecine et de Pharmacie, 87025 Limoges Cedex, France

Objectives: To determine if the origin of the definitive host from which eggs of Fasciola hepatica were collected had an influence on the characteristics of larval development in the same population of Lymnaea truncatula.

Methods: A single population of L. truncatula and 8 isolates of F. hepatica (4 from local cattle, 1 from sheep, 1 from rabbits, 1 from crupys, and 1 from rats) eggs were used. A total of 1,600 snails measuring 4 mm in height (200 snails for each isolate) were individually subjected to bimodal infections before being raised under constant conditions (20°C). The redial burden was studied at day 28 and at day 49 post-infection. The cercarial shadings of F. hepatica were followed until the death of infected snails.

Results: The development of redial burden in L. truncatula and the characteristics of cercarial shedding were the same when miracidia originated from one of the 4 cattle isolates. In contrast, some differences were noted when the other isolates were used. The highest prevalence of infection was noted in snails infected with cattle or crupys miracidia, whereas the lowest was noted with rabbit miracidia. When compared to cattle miracidia, a lower development of rediae was noted in numerous snails, and the frequency of snails harbouring only immature rediae at day 49 was high with rabbit miracidia, moderate with rat or sheep miracidia, and low with crupys miracidia. In snails infected with miracidia originating from cattle, sheep, or rabbit isolates, numerous cercariae emerged during the first shedding wave and smaller numbers during the other successive waves. In the crupys or rat miracidia-infected snails, the release of cercariae was more progressive, with small numbers of cercariae released during each wave.

Conclusions: The larval development of F. hepatica in L. truncatula was influenced by the origin of the definitive host. These results raised again the question of adaptation between F. hepatica and its intermediate host.

Concentration of heavy metals in snails Lymnaea stagnalis (L.) from anthropogenic water reservoirs in the Upper Silesian Industrial Region (southern Poland), with regard to parasitic infection
Z. Pokora, P. Czekaj
Silesian Medical University, Katowice, Poland

Objectives: Analysis of common heavy metal (Zn, Pb, Cd) concentrations in shells and soft tissues of snails Lymnaea stagnalis (L.) collected in selected anthropogenic water reservoirs (sinkholes, sand- and clay-pits), situated in the Upper Silesian Industrial Region.

Methods: Heavy metals in molluscs and samples of bottom sediments were determined by the standard flame method using AAS (Perkin Elmer 703).

Results: Metal concentrations in examined populations of the snail were differentiated, depending upon contents of these metals in bottom sediments. Zn was accumulated more intensively in comparison to other metals in soft tissues, as well as in shells. Concentrations of this metal were characterized by the greatest coefficients of variability. Pb was accumulated in shells, Cd - chiefly in soft tissues. In soft tissues of snails infected by developmental stages of digenetic trematodes significantly higher concentration of Zn was observed in comparison to non-infected individuals (p<0.05). On the other hand, in cases of high intensity of the infection, accompanied by extensive colliquative necrosis of the host's digestive gland, decrease of metal content was noted, what may be explained as the result of destruction of cells participating in its accumulation.

Conclusions: Accumulation of Zn in soft tissues of infected snails may be discussed as the resultant of developed by the host compensatory reactions and pathologic effect of the parasite.