Records

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ACKNOWLEDGEMENTS

AMCOP expresses its gratitude to the following organizations for their contributions to this 34th meeting to make it enjoyable and meaningful.

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General Program Schedule

June 3	3:00 pm -- 12:00 m	Registration--Corbin Hall Reception and Mixer--Don Myer presiding Corbin-Olsen Resource Center
June 4	7:30 am -- 9:30 pm	Registration; Coffee and Rolls Lobby Outside Room 3, Waggoner Hall
	9:00 am -- 9:15 am	Welcome Room 3, Waggoner Hall
	9:15 am --10:15 am	General Session--Contributed Papers Room 3, Waggoner Hall
	10:15 am --10:45 am	Break for Group Picture--Waggoner Hall
	10:45 am --12:00 n	General Session--Contributed Papers
	12:00 n -- 1:15 pm	Lunch--Hardees in the Union will have a salad bar and sandwiches
	1:15 pm -- 3:00 pm	Symposium--Biological Control of Vectors of Human Disease Dr. Sam Singer, Western Illinois University "What is Next in the Use of Sporeforming Bacteria as Insecticides against Vectors of Human Disease" Dr. Joseph V. Maddox, Illinois Natural History Survey "The Biology and Microbial Control Potential of Certain Microsporidia, Fungi, and Nematodes of Insects" This symposium was supported by contribution from the following WIU areas: Graduate Dean, Office of the Provost, Dean of Arts and Sciences, Research Office, Dept. of Biological Sciences.
	3:00 pm -- 4:30 pm	Demonstration Session--Rooms 170-171, Waggoner Hall
	4:30	Business Meeting, Waggoner Hall--Room 3
	6:00 pm	Social Hour--Cash Bar, LaMoine Room, WIU Union
	7:00 pm	Banquet--Buffet, LaMoine Room, WIU Union Speaker: Dr. John D. Briggs, Ohio State University "Biological Control of Invertebrates in International Programs"
June 5	8:00 am -- 9:00 am	Coffee and Rolls--Lobby Outside Room 3, Waggoner
	9:00 am --11:00 am	General Session--Contributed Papers, Room 3
	11:00 am	Business Meeting, Room 3 Waggoner Hall

DEMONSTRATIONS

(* In competition for Herrick Award)

1. ISOPORA EPTESICI N. SP. FROM THE KIDNEYS OF BIG BROWN BATS (EPTESICUS FUSCUS) IN MINNESOTA. WILLIAM J. BEMRICK, DEPARTMENT OF VETERINARY PATHOBIOLOGY, UNIVERSITY OF MINNESOTA, ST. PAUL, MN 55108.

2. FREEZE FRACTURE: A SEM TECHNIQUE FOR THE STUDY OF HELMINTHS. WILLIAM H. COIL, DEPARTMENT OF SYSTEMATICS & ECOLOGY, UNIVERSITY OF KANSAS, LAWRENCE, KS 66045.

3. HATCHING OF THE TAPEWORM ONCOSPHERE. WILLIAM H. COIL, DEPARTMENT OF SYSTEMATICS & ECOLOGY, UNIVERSITY OF KANSAS, LAWRENCE, KS 66045.

4.* MATERNAL TRANSMISSION OF MESOCESTOIDES CORTI TETRATHYRIDIA (CESTODA) IN MICE. DAVID BRUCE CONN, DEPARTMENT OF BIOLOGICAL SCIENCES, UNIVERSITY OF CINCINNATI, CINCINNATI, OH 45221.

5.* HOST RESPONSES IN MICE EXPOSED TO GIGANTOBILHARZIA HURONENSIS CERCARIAE. MOHAMED S. DEHLAWI, DEPARTMENT OF ZOOLOGY, BUTLER UNIVERSITY, INDIANAPOLIS, IN 46208.

6. STÜTZZELLE IN MACRACANTHORHYNCHUS HIRUDINACEUS (ACANTHOCEPHALIA). T. T. DUNAGAN AND D. M. MILLER, DEPARTMENT OF PHYSIOLOGY, SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE, IL 62901.

7. A PROPOSED INTERMEDIATE HOST FOR TANAORHAMPHUS LONGIROSTRIS. J. H. HUBSCHMAN, BIOLOGICAL SCIENCES, WRIGHT STATE UNIVERSITY, DAYTON, OH 45435.

8. PREVALENCE OF BLACK SPOT (NEASCUS PYRIFORMIS: TREMATODA:DIPLOSTOMATIDAE) OF FISHES FROM BRULE CREEK, SOUTH DAKOTA. ALLEN D. JOHNSON, EDMOUR F. BLOUIN, AND DONALD G. DUNLAP, DEPARTMENT OF BIOLOGY, UNIVERSITY OF SOUTH DAKOTA, VERMILLION, SD 57069.

9. SCANNING ELECTRON MICROSCOPY OF THE EGGS OF BAYLISASCARIS PROCYONIS, B. TRANSFUGA, PARASCARIS EQUORUM, TOXOCARA CANIS AND ASCARIS SUUM. K. R. KAZACOS AND J. J. TUREK, SCHOOL OF VETERINARY MEDICINE, PURDUE UNIVERSITY, WEST LAFAYETTE, IN 47907.

10.* CLAMP WALL ULTRASTRUCTURE AND DEVELOPMENT OF MICROCOTYLE SPINICIRRUS (MONOGENEA). JOHN C. MERGO, JR., DEPARTMENT OF ZOOLOGY, THE OHIO STATE UNIVERSITY, COLUMBUS, OH 43210.

11.* USE OF METHACRYLATE EMBEDDING MEDIA FOR SECTIONING OF ACANTHOCEPHALA. R. L. PRICE, DEPARTMENT OF ZOOLOGY, SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE, IL 62901.

12.* SCANNING ELECTRON MICROSCOPY OF ADULT BAYLISASCARIS PROCYONIS, B. COLUMNARIS, TOXASCARIS LEONINA, ASCARIS SUUM, TOXOCARA CANIS AND T. CATI. D. E. SNYDER, DEPARTMENT OF VETERINARY PATHOBIOLOGY, UNIVERSITY OF ILLINOIS, URBANA, IL 61801.

13.* FINE STRUCTURE OF GIARDIA MURIS CYSTS. NANCY J. TORKE, DEPARTMENT OF ZOOLOGY, UNIVERSITY OF WISCONSIN-MILWAUKEE, MILWAUKEE, WI 53201.

PAPER PRESENTATIONS

(* In competition for LaRue Award)

It is hoped that each paper can be presented in ten minutes.

14. THE CASE FOR PARTHENOGENESIS IN THE GERMINAL SACS OF DIGENETIC FLUKES. R. M. CABLE, DEPARTMENT OF BIOLOGICAL SCIENCE, PURDUE UNIVERSITY, WEST LAFAYETTE, IN 47907.

15. FISH ACANTHOCEPHALANS THAT UTILIZE FRESHWATER ISOPODS (FAM: ASELLIDAE) AS INTERMEDIATE HOSTS IN THE UNITED STATES. P. M. MUZZALL, DEPARTMENT OF NATURAL SCIENCE, MICHIGAN STATE UNIVERSITY, EAST LANSING, MI 48824.

16. VARIABILITY AND REDESCRIPTION OF ACANTHOCEPHALUS DIRUS (VAN CLEAVE, 1931) (ACANTHOCEPHALA: ENCHINORHYNCHIDAE) FROM FISHES IN THE MISSISSIPPI RIVER DRAINAG SYSTEM. O. M. AMIN, UNIVERSITY OF WISCONSIN-PARKSIDE, KENOSHA, WI 53141.

17. EFFECTS OF PABA, METHIONINE, THREONINE, AND PROTEIN LEVEL ON PLASMODIUM BERGHEI IN VIVO. H. KESHAVARZ-VALIAN, G. BOISSONNEAULT, AND N. ALGER, DEPARTMENT OF GENETICS & DEV., UNIVERSITY OF ILLINOIS, URBANA, IL 61801.

18.* TRYPANOSOMA CRUZI: ELISA TITERS OF INFECTED RODENTS TO METACYCLIC STAGE ANTIGENS. DAVID CHAO, DEPARTMENT OF LIFE SCIENCES, INDIANA STATE UNIVERSITY, TERRE HAUTE, IN 47809.

19.* THE SPECIFIC ABSORPTION OF CHOLESTEROL IN HYMENOLEPIS DIMINUTA. WILLIAM J. JOHNSON, DEPARTMENT OF ZOOLOGY, UNIVERSITY OF IOWA, IOWA CITY, IA 52242.

20.* ALTERATION OF HEARTBEAT RATE DUE TO FEEDING IN SCHISTOSOMA MANSONI INFECTED AND UNINFECTED BIOMPHALARIS GLABRATA SNAILS. C. L. WILLIAMS, DEPT. OF ECOLOGY AND BEHAV. BIOL., UNIVERSITY OF MINNESOTA, MINNEAPOLIS, MN 55455.

21.* PREVALENCE OF BAYLISASCARIS PROCYONIS IN HARVESTED INDIANA RACCOONS. J. E. JACOBSON, DEPARTMENT OF FORESTRY AND NATURAL RESOURCES, PURDUE UNIVERSITY, WEST LAFAYETTE, IN 47907.

22.* FATAL CEREBROSPINAL NEMATODIASIS AND VISCERAL LARVA MIGRANS IN DOGS EXPERIMENTALLY INFECTED WITH BAYLISASCARIS PROCYONIS. D. E. SNYDER, DEPARTMENT OF VETERINARY PATHOBIOLOGY, UNIVERSITY OF ILLINOIS, URBANA, IL 61801.

23. CINEMATOGRAPHIC STUDY OF ATTACHMENT BY MIRACIDIA OF CYCLOCOELUM OCULEUM TO SNAILS AND SUBSEQUENT REDIAL PENETRATION. STEPHEN J. TAFT, DEPARTMENT OF BIOLOGY, UNIVERSITY OF WISCONSIN-STEVENS POINT, STEVENS POINT, WI 54481.

24. DEVELOPMENT AND MIGRATION OF GIGANTOBILHARZIA HURONENSIS IN PHYSA GYRINA. W. T. McGEACHIN, DEPARTMENT OF ZOOLOGY, IOWA STATE UNIVERSITY, AMES, IA 50011.

25. BEHAVIORAL RESPONSES OF PHILOPHTHALMUS GRALLI MIRACIDIA IN A MAGNETIC FIELD. ANITA STABROWSKI AND PAUL NOLLEN, DEPARTMENT OF BIOLOGICAL SCIENCES, WESTERN ILLINOIS UNIVERSITY, MACOMB, IL 61455.

26. COENZYME A TRANSFERASE OF ASCARIS MITOCHONDRIA. G. L. McLAUGHLIN AND H. J. SAZ, DEPARTMENT OF BIOLOGY, UNIVERSITY OF NOTRE DAME, NOTRE DAME, IN 46556.

27. PREVALENCE OF BAYLISASCARIS PROCYONIS IN NORTHERN ILLINOIS. B. J. JASKOSKI AND DIANE SUDDUTH, DEPARTMENT OF BIOLOGY, LOYOLA UNIVERSITY OF CHICAGO, CHICAGO, IL 60626.

28. SCANNING ELECTRON MICROSCOPY OF BAYLISASCARIS PROCYONIS ADULTS. K. R. KAZACOS AND J. J. TUREK, SCHOOL OF VETERINARY MEDICINE, PURDUE UNIVERSITY, WEST LAFAYETTE, IN 47907.

29. THE ROLE OF ZINC AND CALCIUM IN EGG HATCHING OF SOYBEAN CYST NEMATODE, HETERODERA GLYCINES. P. M. TEFFT AND L. W. BONE, DEPARTMENT OF PHYSIOLOGY, SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE, IL 62901.

30. CHEMOTAXIS OF LARVAL SOYBEAN CYST NEMATODES, HETERODERA GLYCINES TO HOST ROOTS. M. K. PAPADEMETRIOU AND L. W. BONE, DEPARTMENT OF PHYSIOLOGY, SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE, IL 62901.

31. DISTRIBUTION OF UNISEXUAL AND BISEXUAL INFECTIONS OF NIPPOSTRONGYLUS BRASILIENSIS. G. H. GLASSBURG AND L. W. BONE, DEPARTMENT OF PHYSIOLOGY, SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE, IL 62901.

32. HOST INFLUENCES ON ESTABLISHMENT AND REPRODUCTION OF MOUSE-ADAPTED NIPPOSTRONGYLUS BRASILIENSIS. J. A. SWANSON AND L. W. BONE, DEPARTMENT OF PHYSIOLOGY, SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE, IL 62901.

33. PSEUDOCARCINONEMERTES HOMARI AN ECTOPARASITIC NEMERTEAN ON THE AMERICAN LOBSTER IN THE NORTHWEST ATLANTIC OCEAN. L. S. UHAZY, DIVISION OF BIOLOGICAL SCIENCES, UNIVERSITY OF MISSOURI, COLUMBIA, MO 65211.

ABSTRACTS

DEMONSTRATIONS

1. ISOPORA EPTESICI N. SP. FROM THE KIDNEYS OF BIG BROWN BATS (EPTESICUS FUSCUS) IN MINNESOTA

Over an 18 month period, 97 brown bats were submitted to the Veterinary Diagnostic Laboratory at the University of Minnesota, as rabies suspects. During post-mortem, small, white spots were observed on the surface of some kidneys. Microscopic examination of these bats tissues, particularly those with the visible foci of infection, revealed 14 bats to be infected with a species of kidney coccidian. This was definitely established, based on the microscopic examination of formalin fixed tissue stained with H & E. Unfortunately, the kidneys were in various stages of autolysis, so only color plates show very good definition. Kidneys with visible foci of infection were triturated and suspended in 2.5% potassium dichromatic solution. The suspension was then examined for oocysts using the sugar floatation technique. This revealed typical Isosporan oocysts each containing two sporocysts and four sporozoites. In tissue sections, the four sporozoites were observed in the sporocyst, but no oocyst wall was visible.

Recent findings indicate that many of the sporozoans previously considered to be of unknown taxonomic position, are actually Isospora or a related species. It might prove useful to re-examine some of the incompletely described renal parasites, such as Klossiella, to determine if they should be reclassified.

2. FREEZE FRACTURE: A SEM TECHNIQUE FOR THE STUDY OF HELMINTHS, WILLIAM H. COIL, DEPARTMENT OF SYSTEMATICS & ECOLOGY, UNIVERSITY OF KANSAS, LAWRENCE, KS. 66045.

Cryofracture of specimens and viewing of the cleaved surfaces by SEM gives parasitologists the opportunity to study internal surfaces, capsules, embryos, pathology, etc. The technique is relatively simple and it can yield large amounts of unique information.

Procedure: Specimens for cryofracture should be large enough to be manipulated easily (for example, trematodes less than 1 mm would be difficult to handle). Fixation: I like Acrolein, Formaldehyde, or Glutaraldehyde buffered at pH 7.4 in a 3% sucrose solution. In short follow standard TEM procedure; fix, rinse, post fix in OsO_4, rinse and dehydrate gently to 100% ethanol. Prepare "Parafilm" tubes to hold specimens. Put worm in Parafilm tube, add 100% ethanol, seal and quench in liquid nitrogen (LN). The fracture itself is accomplished in the LN or on a large brass heat sink. I prefer to fracture in the LN. The specimen (frozen in ethanol in the tube) is held in an appropriate position and fractured by sharply tapping a razor blade held over the part to be cleaved. The fragments are thawed in room temperature ethanol. The specimens are then critical point dried with CO_2, mounted on stubs with the fractured side up, coated with gold palladium and then viewed with the scanning electron microscope.

The exact point of fracture cannot be controlled precisely meaning that the cleavage of certain, small structures (such as the Mehlis gland) must be considered quite fortuitous.

HATCHING OF THE TAPEWORM ONCOSPHERE, WILLIAM H. COIL, DEPARTMENT OF SYSTEMATICS & ECOLOGY, UNIVERSITY OF KANSAS, LAWRENCE, KS. 66045.

The demonstration of hatching of the tapeworm oncosphere is generally easily accomplished, but an understanding of the event requires an appreciation of the morphology of the tapeworm egg. Three separate requirements must be met in order to initiate hatching: 1) The outer capsule which is proteolytic-enzyme labile must be removed mechanically with a tissue grinder, 2) a proteolytic enzyme must be used to weaken or destroy the inner capsule or embryophore, 3) the oncosphere must be activated (the six hooks make a characteristic "swimming" motion) in order to escape from the oncosphere.

Procedure: Remove about 4 mm of gravid proglottid(s) from worm and place in a tissue grinder (20 μ clearance), add 1 ml of hatching solution (a 1/1000 solution of trypsin in 50 percent Hanks BSS), and gently homogenize the worms (about twenty strokes of the plunger). Remove a drop of sediment and examine under the microscope.

References:
Caley, F. 1975 Z. Parasitenk. 45:335-346; Coil, W. 1967, 1968, 1970, 1972 all in the Z. Parasitenk (29:356-373, 30:301-317, 33:314-328, 39:183-194); Lethridge, R.C. 1980; Helm. Abst. 49:59-72 (a reivew); Ubelaker, F., H. diminuta, Acad. Press (a review).

H. diminuta is convenient and easy (a thin embryophore), but the Taeniidae and Anoplocephalidae, are interesting due to the unqiue embryophore.

MATERNAL TRANSMISSION OF MESOCESTOIDES CORTI TETRATHYRIDIA (CESTODA) IN MICE. DAVID BRUCE CONN, DEPT. OF BIOLOGICAL SCIENCES, UNIVERSITY OF CINCINNATI, CINCINNATI, OHIO 45221

Asexually proliferative tetrathyridia of Mesocestoides corti were studied to determine means of transmission from female mice to their offspring. Maternal transmission was suggested first by Eckert (1970, Z. Parasitenk. 34: 26) without experimental evidence. Hess (1972, C. R. Acad. Sci. Paris 274: 596) demonstrated transmammary transmission but gave few details; his demonstration of in utero transmission was inconclusive. In the present study, whole mounts and sections of infected mammary glands showed free tetrathyridia in larger milk ducts and free and encapsulated tetrathyridia in mammary parenchyma with continued proliferation. Of 32 uninfected young (6 litters) allowed to nurse on infected foster mothers, 18 (from 4 litters) became infected. In utero transmission did not occur among 132 fetuses (22 litters) taken by caesarean section from infected mothers. However, 19 of these 22 mothers had tetrathyridia in their mammary glands at the time of operation; 9 also had tetrathyridia in the uterus lumen, but none were found in amniotic cavities or placentae. No infection was found among 32 young (7 litters) examined immediately after birth to infected mothers, but before nursing. No infection was found among 30 young (5 litters) removed from infected mothers before first nursing and raised by uninfected fosters. These data suggest that maternal transmission of M. corti tetrathyridia occurs primarily or perhaps exclusively by the transmammary route.

5. HOST RESPONSES IN MICE EXPOSED TO GIGANTOBILHARZIA HURONENSIS CERCARIAE. MOHAMED S. DEHLAWI, DEPARTMENT OF ZOOLOGY, BUTLER UNIVERSITY, INDIANAPOLIS, IN 46208.

White mice, 8 weeks old, were exposed by immersing their tails in water containing cercariae of Gigantobilharzia huronensis, a dermatitis-producing avian schistosome. Cercariae successfully penetrated the tail skin in both initial and challenge exposures. At 15 and 30 minutes after exposure no schistosomula were observed in the dermis, but they were seen either within the stratum corneum or partially extending into the spinosum layer. Within one hour after exposure a few leucocytes had collected around schistosomula in the dermis. Large accumulations of leucocytes were seen around worms 6 hours to 4 days post-exposure. At 4 days most of the schistosomula appeared to be dead. No obvious differences were seen between inflamatory responses around schistosomula during initial infections and those found during challenge infections. Schistosomula were not present in the lungs or liver at 3, 4, or 7 days post-exposure. This suggests that all worms were killed in the skin.

6. STUTZZELLE IN MACRACANTHORHYNCHUS HIRUDINACEUS (ACANTHOCEPHALA). T.T. AND DONALD M. MILLER, DEPARTMENT OF PHYSIOLOGY, SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE, IL 62901.

A reexamination of the anterior medial nerve in M. hirudinaceus has revealed that this structure is not a nerve but the posterior medial extension of a previously undescribed cell. This multinucleated cell is located ventral and slightly anterior to the cerebral ganglion but has no connection to it. Because of the cell's relationship to the lateral and apical sensory organs, it has been designated the 'stutzzelle' or sensory support cell (SSC). The SSC has two anterior lateral processes. Each process extends to one of the lateral sensory bulbs. The SSC also has two posterior processes. These follow the ventral apical cone invertor muscles through the proboscis sheath and eventually come to lie in the center of the proboscis retractor muscles. Anterior to the cerebral ganglion these ducts fuse into a single tube which proceeds to the apical sensory organ.

7. A PROPOSED INTERMEDIATE HOST FOR TANAORHAMPHUS LONGIROSTRIS. J.H. HUBSCHMAN, BIOLOGICAL SCIENCES, WRIGHT STATE UNIVERSITY, DAYTON, OHIO 45435

During a 1981 plankton study of Caesars Creek Lake, Ohio numerous specimens of the calanoid copepod Diaptomus pallidus Herrick were found to contain larval acanthocephala. Examination of fishes collected during the same period disclosed the adult form of Tanaorhamphus longirostris (Van Cleave) in the gizzard shad Dorosoma cepedianum (Lesueur). Several other fish species contained immature forms of that worm - the acanthor and acanthella stages in D. pallidus as well as juvenile and immature worms from fishes will be demonstrated.

8. PREVALENCE OF BLACK SPOT (NEASCUS PYRIFORMIS: TREMATODA:DIPLOSTOMATIDAE) OF FISHES FROM BRULE CREEK, SOUTH DAKOTA, ALLEN D. JOHNSON, EDMOUR F. BLOUIN, AND DONALD G. DUNLAP, DEPARTMENT OF BIOLOGY, UNIVERSITY OF SOUTH DAKOTA, VERMILLION, SD 57069

A total of 8,553 fishes belonging to 10 species and three families from Brule Creek in southeastern South Dakota were examined for black spot. Seven species of two families were infected with the black spot trematode Neascus pyriformis Chandler, 1951. An increase in prevalence and range of infection occurred from fall 1978 to fall 1979 with all seven hosts as well as a significant increase in mean intensity with all samples tested. The significant positive correlation (0.05 level) between fish length and cyst number in 18 of 21 samples tested indicated continual parasite recruitment and lack of an effective host immune response. The mean cyst intensity of the dorsal surface was always significantly greater than the mean intensities of seven other designated body regions for the six host species tested. In general the ranking of the other region means was ventral surface > head > caudal fin > other fins for the five cyprinid hosts, although these means were not always significantly different. The white sucker, a catostomid, exhibited a different general pattern of cyst distribution.

9. SCANNING ELECTRON MICROSCOPY OF THE EGGS OF BAYLISASCARIS PROCYONIS, B. TRANSFUGA, PARASCARIS EQUORUM, TOXOCARA CANIS AND ASCARIS SUUM. K.R. KAZACOS AND J.J. TUREK, SCHOOL OF VETERINARY MEDICINE, PURDUE UNIVERSITY, WEST LAFAYETTE, IN 47907.

The surface structure of the eggs of Baylisascaris procyonis, B. transfuga and Parascaris equorum was studied using light and scanning electron microscopy, and compared to that of Toxocara canis and Ascaris suum eggs. By light microscopy, the egg shells of all species appeared to be of 3 layers. The surface of Baylisascaris and Parascaris eggs was very similar in that each was finely granulated or particulate. They differed from T. canis eggs which were sculptured into numerous pits and ridges, and from A. suum eggs which had large ridges and mammillations. By scanning EM, the surface of Baylisascaris and Parascaris eggs was irregularly granular. On higher magnification, the many granules were part of a fine 3-dimensional framework or lattice of fibrils. There was no evidence of any openings or sutures on these eggs. They were almost identical in surface structure, and were not pitted or mammillate as has been described by others. A fine reticular substructure was also seen in the surface of T. canis eggs by high magnification SEM, but not in A. suum eggs. The surface sculpturing of T. canis eggs into pits and ridges was even and regular, unlike previous SEM depictions of the eggs of this species (Ubelaker and Allison, 1975). The operculum-like region described at one pole of A. suum eggs by Ubelaker and Allison (1975) was also seen in this study.

10. CLAMP WALL ULTRASTRUCTURE AND DEVELOPMENT OF MICROCOTYLE SPINICIRRUS (MONOGENEA) JOHN C. MERGO, JR., DEPARTMENT OF ZOOLOGY, THE OHIO STATE UNIVERSITY, COLUMBUS, OHIO. 43210

At the ultrastructural level the mature clamp wall of M. spinicirrus may be seen to be composed of rigid scleroprotein rods and three distinct tissue layers; an outer tegument lining the exterior clamp surface, an inner tegument lining the clamp lumen, and a muscular layer between the teguments. Both teguments are similar in structure possessing mitochondria, electron dense inclusions, and electron lucent vesticular

inclusions. The muscular layer bound internally and externally by a basement membrane is comprised of groups of myofibers enclosed by a sarcolemma. Numerous glycogen granules and peripherally oriented mitochondria may be seen within these bundles. Electron dense plaques along inner surface of basement membranes serve as attachment sites for myofibers. Clamp sclerites provide rigid structural support for clamp wall and possess additional myofiber attachment plaques along outer surface. Contraction of myofibers may produce a suction in clamp lumen causing clamp to function as an armored or reinforced sucker. Ultastructure of developing clamp lacks rigid myofiber organization and complete tegument. Granular cells associated with developing sclerite may be responsible for production of scleroproteins used in sclerite formation.

11. USE OF METHACRYLATE EMBEDDING MEDIA FOR SECTIONING OF ACANTHOCEPHALA. R. L. PRICE, DEPARTMENT OF ZOOLOGY, SOUTHERN ILLINOIS UNIVERSITY AT CARBONDALE, CARBONDALE, IL 62901

JB-4 embedding media (Polysciences, Inc.) was used to embed Neoechinorhynchus cylindratus and Gracilisentis gracilisentis removed from largemouth bass and gizzard shad, respectively. Advantages of JB-4, when compared to wax embedding, include its water solubility requiring dehydration to only 95% ethanol and rapid infiltration and embedding time. Total time involved after removing worms from the fixative may be as little as 6 to 8 hours. One to two micron sections were obtained using glass knives on an LKB Pyramitome.

12. SCANNING ELECTRON MICROSCOPY OF ADULT BAYLISASCARIS PROCYONIS, B. COLUMNARIS, TOXASCARIS LEONINA, ASCARIS SUUM, TOXOCARA CANIS AND T. CATI. D. E. SNYDER, DEPARTMENT OF VETERINARY PATHOBIOLOGY, UNIVERSITY OF ILLINOIS, URBANA, IL 61801.

With the aid of a scanning electron microscope the surface structures of adult Baylisascaris procyonis, B. columnaris, Toxascaris leonina, Ascaris suum, Toxocara canis, and T. cati were compared in order to justify or refute generic differences proposed by Sprent (1968) in creating the genus Baylisascaris for several ascarid species which had formerly been included in either Toxascaris or Ascaris (family Ascarididae). Three to 5 mm of the cephalic and caudal ends of adult worms recovered at necropsy from their natural hosts were washed, fixed in either hot AFA or 3% phosphate-buffered glutaraldehyde, dehydrated in standard dilutions of ethanol, critical point dried in CO_2, mounted on aluminum stubs, sputter coated with a thin layer of gold and examined with an ISI-DS-130 scanning electron microscope at 10 keV. The unique pericloacal rough areas in the two Baylisascaris spp. were clearly evident; the corresponding structure could be seen vestigally in the postcloacal area of A. suum. The dorsal and subventral labial papillae of B. procyonis, B. columnaris and T. leonina appeared as distinctly divided surfaces, while in A. suum they were undivided, appearing as single elevations. The postcloacal papillae of B. procyonis and B. columnaris were similar to those of A. suum, except for a difference in the location of the phasmidial pores; the postcloacal papillae were distinctly different from those of T. leonina. On the basis of this SEM examination, it would appear that the creation of the genus Baylisascaris by Sprent (1968) was justified. Scanning electron micrographs will be presented illustrating the characteristic microtopographic features of each of the above species of ascarid.

FINE STRUCTURE OF *GIARDIA MURIS* CYSTS. NANCY J. LORKE, DEPARTMENT OF ZOOLOGY, UNIVERSITY OF WISCONSIN MILWAUKEE, MILWAUKEE, WI 53201

Structure of *Giardia muris* cysts was examined by transmission electron microscopy. Cysts were enclosed by a resistant cyst wall composed of a homogeneous fibrous network 0.3 μm thickness. The cyst wall was not stained by either ruthenium red or PATCO indicating a lack of mucopolysaccharide within this area. The parasite cytoplasm was characterized by two anterior nuclei, copious free ribosomes and glycogen. Glycogen was identified by PATCO cytochemistry. Flagellar axonemes and disassociated elements of the striated disc were common. The peripherial cytoplasm contained a regular series of vacuoles. This may represent an intracytoplasmic network for transport of cellular elements. The central area of cytoplasm abounded in rounded formations surrounded by a double membrane. These structures may be bacterial endosymbionts. These symbionts may play an important role in *Giardia* virulence and drug resistance by virtue of their extranuclear genetic material.

te additions
A.
13.
miracid. produced by a Sporocyst - closely resembles a Schistosome

PAPERS

4. THE CASE FOR PARTHENOGENESIS IN THE GERMINAL SACS OF DIGENETIC FLUKES. R.M. CABLE, WEST LAFAYETTE, IN 47906

Parthenogenetic reproduction within the germinal sacs of digeneans has been questioned, most recently by Haight et al (1977, J. Parasit. 63:267-273) in a study of nuclear morphology and DNA content in cercarial (?) embryos of an avian schistosome. While such a study could scarcely throw light on how sporocysts and rediae reproduce, it did give further evidence of the widespread occurrence of minute dense nuclei in early embryos of all stages in the life cycle. They have been interpreted as degenerating nuclei, polar bodies, and primordial germ cells (oogonia in germinal sacs), or noncommitally referred to as blebs. They disappear as such with continued development of the embryo. Earlier, Clark (1974, Int. J. Parasit. 4:115-123) dismissed cytological evidence of parthenogenesis in a life cycle interpreted as a sequence of polymorphic generations. Instead, he suggested that the life cycle consists of stages in a single generation in which metamorphosis and reproduction by internal budding leads to the adult. Cytological, ecological and experimental evidence to the contrary will be presented.

Schistosoma l.c. by James has 2 gen. of cercaria

15. FISH ACANTHOCEPHALANS THAT UTILIZE FRESHWATER ISOPODS (FAM: ASELLIDAE) AS INTERMEDIATE HOSTS IN THE UNITED STATES. P.M. MUZZALL, DEPARTMENT OF NATURAL SCIENCE, MICHIGAN STATE UNIVERSITY, EAST LANSING, MI 48824

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Fish acanthocephalans occurring in freshwater epigean isopods (Fam: Asellidae) in the United States are represented by the genera Acanthocephalus and Fessisentis. The isopod genera Asellus and Lirceus serve as intermediate hosts for species of these acanthocephalans. The geographic locations of where studies have occurred are mapped and the acanthocephalan-isopod species pairings are systematically arranged. Several host-parasite relationships between larval acanthocephalans and their isopod hosts are discussed.

16. VARIABILITY AND REDESCRIPTION OF ACANTHOCEPHALUS DIRUS (VAN CLEAVE, 1931) (ACANTHOCEPHALA: ENCHINORHYNCHIDAE) FROM FISHES IN THE MISSISSIPPI RIVER DRAINAGE SYSTEM. O. M. AMIN, UNIVERSITY OF WISCONSIN-PARKSIDE, KENOSHA, WISCONSIN 53141.

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Careful examination of various Acanthocephalus dirus populations from the Mississippi River drainage system in Mississippi, Kentucky, Illinois, West Virginia, Wisconsin, and Ohio revealed it to be the most variable species of the genus from North American freshwater fish. These findings are substantiated by morphometric comparisons and meristogram analysis. The species is redescribed. Some populations previously reported as A. jacksoni Bullock, 1962 from Kentucky, Illinois, and Ohio are reassigned to A. dirus and adjustments in host and locality records are indicated. Variability in males and females was comparable to that previously reported for A. jacksoni and A. parksidei Amin, 1975. The number of proboscis hooks per row was relatively high in southern populations from Mississippi (11-13) but became more variable in the more northern populations having rows with as few as six and eight hooks in males and females, respectively. The taxonomic implications of the new expanded diagnosis of A. dirus are discussed.

17. EFFECTS OF PABA, METHIONINE, THREONINE, AND PROTEIN LEVEL ON PLASMODIUM BERGHEI IN VIVO. H. KESHAVARZ-VALIAN, G. BOISSONNEAULT, AND N. ALGER. DEPARTMENT OF GENETICS & DEV., UNIVERSITY OF ILLINOIS, URBANA, IL 61801

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The roles of dietary para-aminobenzoic acid (PABA), methionine, threonine, and protein level on Plasmodium berghei infection were investigated. Absence of PABA from the diets resulted in a highly significant decrease in per cent of mortality in all groups studied ($p < 0.005$). In animals fed a diet containing 20% casein, supplemental methionine (1.5g methionine/100g casein) favors the parasite as shown by a decrease in the day of death ($p < 0.005$) post-infection, but does not significantly effect the mortality rate. No significant alterations in the day of death post-infection or in the mortality rate were found with methionine supplementation of a diet containing 12% casein. Supplementation of the 12% casein diet (with added methionine) with threonine resulted in a significant reduction in per cent mortality rate ($p < 0.01$) regardless of the supplemental levels of threonine used (0.75, 2.75, or 4.75g threonine/100g casein). As supplemental threonine was increased in the 20% casein diet, the average day of death post-infection was also increased but mortality rate was not effected. The protein level per se seems not to be the critical factor, provided a protein deficiency does not exist, but a minimum amount of threonine available to the animal is clearly necessary for proper function of immune response.

8. TRYPANOSOMA CRUZI: ELISA TITERS OF INFECTED RODENTS TO METACYCLIC STAGE ANTIGENS. DAVID CHAO, DEPARTMENT OF LIFE SCIENCES, INDIANA STATE UNIVERSITY, TERRE HAUTE, IN 47809.

Metacyclics of the Tulahuén strain of Trypanosoma cruzi were collected after 17 days of cultivation in LMC medium, purified on DEAE-Sephacel, frozen and thawed 6 times in buffered saline, and centrifuged. The supernatant extract was used in an enzyme-linked immunosorbent assay (ELISA). Antisera were collected from T. cruzi infected rats at 7-day intervals. Goat anti-rat IgG serum labeled with alkaline phosphatase was used in the ELISA. Antisera giving an optical density of 0.080 at 405 nm after 1 hour of the addition of the substrate were regarded as positives. Antibodies were detected on day 14 at 1:80. Titers of 1:160 were obtained on day 21 and 28, 1:320 on day 35, 1:640 on day 42 and reached 1:1280 on day 180. Antisera from rats infected with strains of Trypanosoma lewisi did not produce detectable responses. Antisera were collected at 5-day intervals from T. cruzi infected mice. Alkaline phosphatase-labeled goat anti-mouse IgG serum was employed. Antibodies were detected at titers of 1:40, 1:80, 1:160 and 1:640 on days 10,15,20 and 25, respectively. After 25 days, they remained at 1:640. Antisera of mice which received 3 injections of lyophilized epimastigotes at 7-day intervals or 8 injections of frozen and thawed epimastigotes at 3-day intervals displayed titers of 1:320. Normal sera and antisera from mice infected for 5 days reacted at titers of 1:20. Other studies in our laboratory with infected rats detected precipitating antigen-antibody systems 21 days after infection which increased in numbers during an 8 week period. ELISA titers of infected and immunized rodents indicate metacyclics share antigens with the epimastigotes, bloodstream, and/or tissue stages of the parasite and have potential for serodiagnostic reagents.

9. THE SPECIFIC ABSORPTION OF CHOLESTEROL IN HYMENOLEPIS DIMINUTA
WILLIAM J. JOHNSON, DEPARTMENT OF ZOOLOGY, UNIVERSITY OF IOWA, IOWA CITY, IOWA, 52242

Work by others has shown that H. diminuta does not synthesize sterols de novo, but that it has large quantities of cholesterol, and very little of any other sterol, in its tissues. These data suggest that the worm regulates its sterol composition, since plant sterols (e.g., β-sitosterol), as well as cholesterol, are abundant in the small intestines of rats fed a normal, plant-based diet. Three mechanisms might account for this regulation: 1.) the specific absorption of cholesterol, 2.) the specific secretion of absorbed plant sterols, and 3.) the enzymatic dealkylation of absorbed plant sterols to cholesterol. These possibilities were studied in the following ways. In vivo and in vitro experiments demonstrated that net uptake of cholesterol is 10 to 30 times more efficient than uptake of β-sitosterol, suggesting that mechanism (3) contributes little, if any, to the regulation. The profile of sterols from the tegumentary brush border, as analyzed by gas-liquid chromatography, is the same as exists in the whole worm, suggesting that specificity for cholesterol is imposed early in the absorption process, and that mechanism (2) probably cannot fully account for the regulation of sterol composition. Therefore, mechanism (1), the specific absorption of cholesterol, probably occurs at the tapeworm's brush border. When studied in vitro, absorption of cholesterol had the characteristics of facilitated diffusion, in that it was saturable, strongly inhibited by iodoacetamide, only moderately inhibited by arsenite or azide, and much more strongly inhibited by excess cholesterol than by other sterols.
(Supported by NSF Grant PCM7911770 and NIH Training Grant 5T32GM0722803.)

20. ALTERATION OF HEARTBEAT RATE DUE TO FEEDING IN SCHISTOSOMA MANSONI INFECTED AND UNINFECTED BIOMPHALARIA CLABRATA SNAILS. C. L. WILLIAMS, DEPT. OF ECOLOGY AND BEHAV. BIOL., UNIV. OF MINNESOTA, MINNEAPOLIS, MN 55455

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In 1980, Becker stated that a 30-day Schistosoma mansoni infection of Biomphalaria glabrata leads to a physiological state of the snail resembling starvation. By measuring the heartbeat rates of feeding and non-feeding B. glabrata (PR 1) snails, I have found that feeding snails have greater heartbeat rates than non-feeding snails. This increase in heartbeat rate occurs as soon as the snails begin grazing on lettuce and does not depend on previous starvation. To determine if an altered feeding response causes the increased heartbeat rate of S. mansoni-infected B. glabrata (observed by Lee and Cheng, 1970), the heartbeat rates of several groups of 30-day S. mansoni infected and uninfected B. glabrata (PR 1) were measured every 2 hours for 24 hour periods under different feeding schedules. When snails were allowed to feed on lettuce ad libitum, infected snails had greater heartbeat rates than uninfected snails during the daytime hours. However, when snails were starved for 24 hours, infected snails had heartbeat rates similar to uninfected snails. Also, when uninfected snails were starved for approximately 8 hours and then fed lettuce at 9^{00} and 21^{00}, uninfected snails had heartbeat rates similar to non-starved, infected snails. In a further investigation, it was found that a decreased heartbeat rate due to starvation for a 24 hour period did not alter the number of cercariae emerging from infected B. glabrata during the period of starvation or for 24 hours after the snails had resumed feeding. These results show that the act of feeding drastically and immediately affects the heartbeat rate of snails and may contribute to the increased heartbeat rate of S. mansoni-infected B. glabrata.

21. PREVALENCE OF BAYLISASCARIS PROCYONIS IN HARVESTED INDIANA RACCOONS. J.E. JACOBSON, DEPARTMENT OF FORESTRY AND NATURAL RESOURCES, PURDUE UNIVERSITY, WEST LAFAYETTE, INDIANA 47907 U.S.A.

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One hundred and four of 147 (70.7%) harvested raccoons (Procyon lotor) collected in Tippecanoe County, Indiana from November 1981 to January 1982 harbored Baylisascaris procyonis, an ascarid of animal health significance. This parasite occurred in 20 of 29 (69.0%) adult male, 15 of 35 (42.9%) adult female, 27 of 33 (81.8%) juvenile male, and 42 of 50 (84.0%) juvenile female raccoons. The prevalence of B. procyonis for juvenile raccoons (83.1%) was significantly ($p<.05$) greater than for adult raccoons (54.7%). The prevalence of this parasite for adult male raccoons was significantly greater than for adult female raccoons. An average of 22.4 (range of 0 to 141) B. procyonis were found per raccoon. Male B. procyonis averaged 9.1 (range of 0 to 59) individuals, and females averaged 11.4 (range of 9 to 91) individuals per raccoon. Fecal samples from 82 of the 147 raccoons were analyzed for eggs of this parasite. The number of eggs per gram of feces averaged 9685 (range of 0 to 110,300). No significant difference for the mean number of eggs of B. procyonis existed between any raccoon age and sex group. A mean of 609 eggs per gram of raccoon feces was produced by each female B. procyonis. Seventy-two of 77 (93.5%) raccoons harboring female B. procyonis had eggs from this parasite in their feces.

22. FATAL CEREBROSPINAL NEMATODIASIS AND VISCERAL LARVA MIGRANS IN DOGS EXPERIMENTALLY INFECTED WITH BAYLISASCARIS PROCYONIS. D. E. SYNDER, DEPARTMENT OF VETERINARY PATHOBIOLOGY, UNIVERSITY OF ILLINOIS, URBANA, IL 61801.

To determine the potential cross-transmissibility of the raccoon ascarid, Baylisascaris procyonis, 5 eleven week-old beagle cross-bred puppies (4 males and 1 female) were inoculated per os with 10,000 to 200,000 infective B. procyonis eggs. Five uninoculated puppies served as controls. Three of the 5 experimental animals developed severe CNS dysfunction, 2 of them dying 14 days postinoculation. Clinically the affected animals had ataxia, falling, circling, opisthotonos, inability to maintain balance or upright posture and exophthalmia. At necropsy larval granulomas were not seen; however, large ulcerative areas were evident in the pylorus of the animals which died and which had received the 2 highest dosages of infective eggs (100,000 and 200,000). Larvae were found in the brain, heart, and skeletal muscle of these 3 animals. The host range for B. procyonis is thus extended and the ability of this parasite to cause cerebrospinal nematodiasis and visceral larva migrans in the dog is established.

3. CINEMATOGRAPHIC STUDY OF ATTACHMENT BY MIRACIDIA OF CYCLOCOELUM OCULEUM TO SNAILS AND SUBSEQUENT REDIAL PENETRATION

STEPHEN J. TAFT
(Department of Biology, University of Wisconsin-Stevens Point, Stevens Point, Wisconsin 54481)

Cyclocoelum oculeum miracidia are unusual in that they contain a fully-formed redia. Upon contact with a snail, a miracidium immediately inserts its apical papilla through the snail's epithelial layer to or just beyond the basement membrane. After penetration by the apical papilla, the first tier of miracidial epidermal plates is shed. The region previously covered by these plates is drawn into the epithelial layer of the snail. Following this, vigorous contractions by the longitudinal and circular muscles of the anterior third of the miracidium occur. These movements aid in pumping apical gland contents into the snail. Concomitantly the redial stage is actively moving and enlarging the cavity it occupies by destroying miracidial tissue; its anterior end is particularly active, constantly probing in the region near the base of the apical papilla. Eventually this probing action produces a hole in the miracidial membranes. As the redial stage starts to move through this opening, the apical papilla retracts. The emerging redia enters a snail hemolymph vessel, propelled forward by its large posterior appendages.

24. DEVELOPMENT AND MIGRATION OF GIGANTOBILHARZIA HURONENSIS IN PHYSA GYRINA. W. T. McGEACHIN, DEPARTMENT OF ZOOLOGY, IOWA STATE UNIVERSITY, AMES, IA 50011

Laboratory studies on Physa gyrina infected with Gigantobilharzia huronensis, a schistosome parasite of birds whose cercariae can cause "swimmers' itch" in man, were carried out to trace intramolluscan development and migration of the parasite and to determine whether a host response was present. In sectioned material it was shown that daughter sporocysts migrate from the mantle and cephalopedal sinus to the hepatopancreas via the hemolymph vessels and sinuses, particularly the rectal sinus, whereas cercariae migrate from the hepatopancreas to the mantle within the mantle tissue between the rectal sinus and the visceral vein. A host response involving encapsulation of cercariae and hyperplasia of an amoebocyte organ occurred in snail hosts by about two months after initial cercarial emergence. In one case, a much longer than normal prepatent period was found in a snail in which an abnormally intense amoebocytic response and ectopic daughter sporocyst development occurred. Photoperiod was consistently found to be the most important factor in triggering cercarial emergence.

25. BEHAVIORAL RESPONSES OF PHILOPHTHALMUS GRALLI MIRACIDIA IN A MAGNETIC FIELD. ANITA STAEROWSKI AND PAUL NOLLEN, DEPARTMENT OF BIOLOGICAL SCIENCES, WESTERN ILLINOIS UNIVERSITY, MACOMB, IL 61455.

Miracidia are known to show behavioral responses to chemicals, light, and gravity. Different species react in various ways to these environmental cues. The miracidia of Philophthalmus gralli, an eyefluke of birds, have been studied extensively for their reaction to these cues. Among the least understood of these behavioral responses is the strong positive geotaxis. To see if miracidia of P. gralli were responding to the earth's magnetic field to exhibit this downward movement, a series of experiments were carried out to determine their orientation in magnetic fields of various strengths and for various periods of time. In field strengths from 3-200 gauss and time periods from 1-15 minutes, a significant number of miracidia were found in the north section of a choice chamber when compared to those in the south section. The best north-seeking response was found at exposures of 5 gauss for 3 minutes. Miracidia in a choice chamber under normal magnetic conditions (0.7 gauss) also showed a significant north-seeking response. Miracidia from a single hatch exhibited a diminishing north-seeking response as they aged over 5 hours, but at 5 hours a significant number were still found in the north section of the choice chamber. When the south section was illuminated and the north section darkened in a field of 3 gauss, a significant number were found in the south section. Thus the positive magnetotaxis was overridden by the positive phototactic response. The north-seeking response shown by P. gralli miracidia then explains the strong positive geotactic response, since in the northern hemisphere the north magnetic field is directed toward the earth. (Supported by a grant from the Illinois State Honors Council)

26. COENZYME A TRANSFERASE OF ASCARIS MITOCHONDRIA. G. L. MCLAUGHLIN AND H.J. SAZ, DEPARTMENT OF BIOLOGY, UNIVERSITY OF NOTRE DAME, NOTRE DAME, IN 46556

Coenzyme A transferase is required for the ATP generating formation of propionate from succinate in mitochondria from Ascaris, Fasciola, and Spirometra. This enzyme catalyzes: R-CoA + R' $\rightleftharpoons$ R'CoA + R. The importance of determining the physiological R and R' groups has been stressed (Pietrzak & Saz, Mol. Biochm. Parasitol., 3:61-70 (1981)). It has been proposed that coenzyme A transferase links the formation of branched chain fatty acids with succinate accumulation in Ascaris. The presence or absence of this enzyme then, could be a determinant of the end products of a helminth's metabolism. Therefore, attempts are in progress to purify and characterize the enzyme from Ascaris mitochondria.

The coenzyme A transferase of Ascaris mitochondria has been partially purified by ammonium sulfate precipitation, ion exchange and affinity chromatography. A sensitive spectrophotometric assay system for this enzyme has been developed by coupling with citrate synthase and detecting the free-SH groups liberated with the yellow dye DTNB (5,5'-dithiobis-(2-nitrobenzoic acid). Preliminary results indicate that coenzyme A transferase is a dimer of approximately 50,000 Dalton subunits. Our data, and earlier data, agree that there is a broad specificity for CoA donors and acceptors. Coenzyme A apparently can be donated from acetyl-, propionyl-, valeryl-, butyryl-, succinyl-, or tiglyl CoA to either acetate, propionate, or succinate. Propionyl CoA to acetate activity is not altered by 5 mM ATP, ADP, NADH, or NAD, suggesting that coenzyme A transferase is not regulated by these nucleotides.

Supported in part by NIH Grants AI-09483 and AI-07030.

27. PREVALENCE OF BAYLISASCARIS PROCYONIS IN NORTHERN ILLINOIS. B. J. JASKOSKI and DIANE BUDDUTH, DEPARTMENT OF BIOLOGY, LOYOLA UNIVERSITY OF CHICAGO, CHICAGO, ILLINOIS 60626

As reported here and elsewhere, Kazacos(1980,1981) demonstrated the importance of B. procyonis as a zoonosis of significance from studies involving chickens, quail, and primates. Other studies by Snyder and Fitzgerald(1979) and Barnstable and Dyer(1974) indicate a high prevalence of this nematode in raccoons in Illinois. Examination of the carcasses of 58 raccoons in a 17 county area in northern Illinois showed that 39 (67%) harbored B. procyonis. Weight, length and sex for most of the raccoons were related to infection rate with B. procyonis. (There were 22 raccoons of unknown body weight). The infection rate was higher for the smaller raccoons. Little difference was observed in the infection rate for male raccoons (18 of 28 infected, or 64%) as compared with females(21 of 30, or 70%). Preliminary studies of B. procyonis infective eggs fed to the gerbil indicate a migration and suggest brain involvement as noted in symptoms involving ataxia, loss of balance, tremor in forelimbs, and others.

28. SCANNING ELECTRON MICROSCOPY OF BAYLISASCARIS PROCYONIS ADULTS. K.R. KAZACOS AND J.J. TUREK, SCHOOL OF VETERINARY MEDICINE, PURDUE UNIVERSITY, WEST LAFAYETTE, IN 47907.

Adult male and female Baylisascaris procyonis were studied by scanning electron microscopy. The apical portion of each of the three lips was smooth and the basal part reticulated. The dorsal lip bore two dorsolateral double and two internal labial papillae. The two subventral lips each bore one ventrolateral double and one externolateral papilla, two internal labial papillae and an amphid. The small papilla of each double set was dome-shaped and smooth, while the larger papilla was broad and with a prominent central pore. The externolateral papillae had raised, highly sculptured surfaces with numerous slits and creases. The internal labial papillae consisted of pits. Denticles arose as a single row from the apical edge of the inner labial surface, were evenly spaced, and pyramidal or conoidal in shape. Denticles were typically unicuspid (although bicuspids were also seen) and their size and shape varied between and upon specimens. A pit was seen in the central region of the denticular row. Cervical papillae were present, and cervical alae were small but apparent. Males and females possessed a pointed mucron posterior appendage. Male worms had characteristic pericloacal rough areas as well as a large double precloacal papilla. Numerous mammiform caudal papillae were seen in two ventrolateral rows; several postcloacal papillae were doubles. Spicules were highly sculptured, with pincer-like ends and terminal pore-like openings.

29. THE ROLE OF ZINC AND CALCIUM IN EGG HATCHING OF SOYBEAN CYST NEMATODE, HETERODERA GLYCINES. P.M. TEFFT AND L.W. BONE, DEPARTMENT OF PHYSIOLOGY, SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE, IL 62901

Chloride and sulfate salts of zinc significantly increased hatching of larvae from free eggs of the soybean cyst nematode Heterodera glycines Race 3. Calcium as the sulfate or chloride salt had no effect on hatching compared to distilled water controls. The calcium inhibitors, ruthenium red and lanthanum chloride, and the ionophore A23187 had no influence on egg hatching in distilled water. Calcium concentrations from 10 mM to 80 mM potentiated the hatching effect of zinc chloride (3 mM). Ruthenium red and lanthanum chloride in conjunction with zinc chloride (3 mM) had no effect on the hatching response due to zinc chloride, but solutions of manganese chloride and magnesium chloride inhibited the hatching response to zinc chloride. Timed incubation of eggs in 3 mM zinc chloride for 2, 8, 48, and 96 hours caused a significant increase in hatching compared to non-exposed eggs. Artificial hatching agents for other cyst nematode species were tested also. Picrolonic acid caused an increase in hatching of H. glycines while sodium meta-vanadate had no effect.

30. CHEMOTAXIS OF LARVAL SOYBEAN CYST NEMATODES, HETERODERA GLYCINES TO HOST ROOTS. M.K. PAPADEMETRIOU AND L.W. BONE, DEPARTMENT OF PHYSIOLOGY, SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE, IL 62901

Larvae of the soybean cyst nematode, Heterodera glycines Race 3, were significantly attracted to root leachate from pooled soybean plants during in vitro bioassay. The larval response to root solutions was dosage- and time-dependent. Responses were influenced also by the diffusion period of the attractant. Little variation in attractiveness was found through bioassay of solutions from twelve individual plants. The attractive host compound(s) was water-soluble, based on organic extraction and Sep-Pak fractionation, and apparently non-volatile. Freezing had no effect on the host attractant, but elevated temperature reduced the biological activity. Production of the attractant(s) by roots decreased from 24 to 120 hours of preparation by percolation. Storage of root solution at 4 C for 18 days revealed no remaining activity according to bioassay.

31. DISTRIBUTION OF UNISEXUAL AND BISEXUAL INFECTIONS OF NIPPOSTRONGYLUS BRASILIENSIS. G.H. GLASSBURG AND L.W. BONE, DEPARTMENT OF PHYSIOLOGY, SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE, IL 62901

Natural bisexual infections of Nippostrongylus brasiliensis showed a large population peak at 20% of the pyloric-caecal distance. Surgical transfer of females to the anterior intestine induced dosage-dependent locomotion by posteriorly placed males. Movement of males was age-, time-, and distance-dependent. Peristalsis apparently disrupted the locomotion of anterior males to posterior females in the intestine.

Male or female groups of N. brasiliensis were injected also at 5, 20, and 40% of the pyloric-caecal distance to assess their unisexual behavior. Males were distributed along the anterior half of the intestine while females aggregated at the anterior 5 and 20% segments of the intestine. Injections of bisexual populations of worms differed significantly when compared to unisexual infections. Bisexual populations reduced the male's dispersal behavior as seen in unisexual infections and arrested the females preferential localization at the 5 and 20% intestinal sites as seen in unisexual populations. Thus, male behavior in the intestine was apparently mostly sexual, while female helminths responded to probable nutritional and sexual stimuli.

32. HOST INFLUENCES ON ESTABLISHMENT AND REPRODUCTION OF MOUSE-ADAPTED NIPPOSTRONGYLUS BRASILIENSIS. J.A. SWANSON AND L.W. BONE, DEPARTMENT OF PHYSIOLOGY, SOUTHERN ILLINOIS UNIVERSITY, CARBONDALE, IL 62901.

Adult male mice innoculated with various dosages of Nippostrongylus brasiliensis larvae had higher percent recoveries of adult worms than adult female mice. Castrated males had lower worm establishments than intact males at all dosages while ovariectomized females had greater worm burdens at most dosages as compared to intact females. An age dependency of worm establishment was observed in both sexes of mice.

Total egg production/female worm for 4 days increased linearly with increasing worms in female mice. Egg production and worm burden was not related in the male host, but mean egg production was significantly higher in the male versus female host. The helminth density dependent effect on egg production was absent in ovariectomized mice.

Gonadectomized mice of both sexes were implanted with testosterone (T) capsules to examine any relationship between plasma T level and egg production. Gonadectomized animals exhibited T-dependent egg production by helminths according to RIA.

33. PSEUDOCARCINONEMERTES HOMARI AN ECTOPARASITIC NEMERTEAN ON THE AMERICAN LOBSTER IN THE NORTHWEST ATLANTIC OCEAN. L.S. UHAZY, DIVISION OF BIOLOGICAL SCIENCES, UNIVERSITY OF MISSOURI, COLUMBIA, MO. 65211

In 1978, a monostiliferan hoplonemertean was recovered from the decimated egg masses of an American lobster (Homarus americanus) caught by a commercial fisherman off Grand Manan Island situated between the Bay of Fundy and the Gulf of Maine. Although lobster had been studied by generations of scientists and these studies included surveys of parasites and fouling organisms, it was difficult to imagine its' being over looked. Preliminary field studies of P. homari Fleming and Gibson, 1981 indicated a remarkable biological similarity to Carcinonemertes errans, a major egg predator and mortality factor in the California Dungeness crab (Wickham, 1980, Biol. Bull. 159: 247-257). The apparent sudden occurrence of this organism and the extreme economic importance of the lobster fishery warrants continued study of this parasite and its' impact on the reproductive success of the lobster.

Late addition
G.
D.

Minutes of the Business Meeting

33rd Annual Midwestern Conference
of Parasitologists

The 33rd annual midwestern conference of parasitologists (AMCOP) was held on the campus of Eastern Illinois University at Charleston, 4-6 June, 1981. One hundred and four persons were registered.

Session I

The meeting was called to order by Dr. Donald M. Miller, Presiding Officer at 4:30 p.m. June 5, 1981.

Minutes of AMCOP-32 as appearing in the program for this meeting (pages 16-18) were approved with the correction of a date at the bottom of page 16 from June 13 to June 14.

The Presiding Officer called for any old business, there being none he called for new business starting with a Treasurer's Report.

Dr. Garoian presented a Treasurer's Report detailing an income of $835.77 with expenses of $483.75 for the period of June 14, 1980 to June 5, 1981. It was mentioned that this did not include any expenses of the present meeting that may not be covered by the registration fee or the generosity of the host institution. It was moved, seconded and approved to accept the Treasurer's Report.

The following committees were appointed by Dr. Miller:

Judging of Demonstrations (for Herrick Award): Donal G. Myer and Peter W. Pappas.

Judging of Papers (for LaRue Award): Melvin Denner and James R. Coggins.

Nominating: William H. Coil and Arthur E. Duwe.

Future Meeting Sites: George D. Cain, Paul Nollen, and Charles M. Vaughn.

Future Programs: Allen D. Johnson and Elizabeth L. Waffle.

Resolutions: John L. Crites and William G. Dyer.

Audit: Lew Peters

The business meeting was recessed by Dr. Miller at 4:45 to reconvene at 11:00 a.m. Saturday, June 6.

Dr. Miller reconvened the business meeting at 11:00 a.m. June 6 with a call for committee reports.

Audit: Dr. Peters reported that he reviewed all bills paid and bank statements and found records in order. Motion to accept made, seconded, and approved.

Future Sites: Dr. Nollen reported for the committee recommending the next annual meeting be held on the campus of Western Illinois University at Macomb, Illinois; for 1983. The College of Veterinary Medicine of the University of Illinois at Urbana; and at either the University of Iowa, Iowa City or Ohio State University, Columbus in 1984. Motion made to accept, seconded and approved.

Future Programs: Dr. Waffle reported for the committee recommending that next year's meeting present a special program on one or more of these topics: biological control of parasites, scanning electron microscopy, and/or Sarcocystis and related coccidians of carnivores. Motion made to accept, seconded and approved.

The following Resolution Committee report was given by Dr. Dyer:

Whereas: Dr. Bill T. Ridgeway, Program Director, coordinated the many aspects of this meeting at Eastern Illinois University in a commendable manner, and

Whereas: Dr. Daniel Marvin, Jr., President, Eastern Illinois University, and Dr. Leonard Durham, Director, Division of Life Science, extended a warm welcome to AMCOP members and provided facilities for this meeting, and

Whereas: The Zoology Club provided coffee and donuts, and

Whereas: Eli Lilly and Company generously provided funding for the Herrick Award, and Ann Arbor Biological Center supported the LaRue Award, along with a member of anonymous contribution from AMCOP members, and

Whereas: Dr. Julius C. Kreier, Dr. John M. Mansfield and Dr. Miodrag Ristic provided for a scholarly symposium or immunity to protozoan parasites, and

Whereas: Dr. George D. Cain presented an enlightening seminar on techniques to study antigenic variation, and

Whereas: Dr. George Garoian provided registration and program information in efficient and timely manner, and

Whereas: The papers and demonstration were of high quality, and

Whereas: Dr. Donald M. Miller, presiding officer, provided an excellent format for the presentation of papers and the business meetings

Be it hereby resolved, that the membership of the 33rd Annual Midwestern Conference of Parasitologists meeting express their deep gratitu[illegible] and sincere appreciation to all of the aforementioned on this occasion.

Dr. Waffle presented the G. R. LaRue Award for the outstanding paper presentation by a graduate student to Benjamin N. Tuggle, National Wildlife Health Laboratory, Madison, Wisconsin who is a graduate student in zoology at Ohio State University (Dr. J. L. Crites, advisor) for his paper "Renal Coccidiosis in Canada Geese of the Mississippi Flyway."

On behalf of the Eli Lilly Company, Milo Brandt presented the C. A. Herrick Award to Jon M. Holy of the Department of Biology, University of Wisconsin-Eau Claire (Dr. Darvin Wittrock, advisor) for his demonstration "Electron Microscopy of Egg Shell Formation in Halipegus eccentricus (Trematoda: Hemiuridae)."

Dr. Miller presented Awards of Appreciation to Eli Lilly Company (Milo Brandt, representative) for 14 years of support for the Herrick Award and to Ann Arbor Biological Center (Elizabeth Waffle) for five years of support for the LaRue Award.

Dr. Miller reported that because of concern for the few demonstrations presented by graduate students in recent years he had asked the Policy Committee (Recent Past Presidents Gilbertson, Hugghins, and Johnson) to discuss possible means of encouraging more student participation in this. Dr. Gilbertson reported that the committee had two recommendations: 1) That a letter be sent by the secretary to all members expressing this concern for the decline in this aspect of AMCOP meetings and to encourage all advisors to strongly urge their students to participate in the poster/demonstration session. 2) That a procedure be phased in whereby a student must have participated in a previous poster/demonstration session to be eligible for a LaRue Award in the paper session. It was moved and seconded to accept the report. There was discussion revolving around maintaining the informal tradition of AMCOP and a desire to consider the proposal for some time before voting. The question was called and the motion was defeated. It seemed a concensus that a letter expressing concern still be sent to all members.

Nominating Committee: Dr. Coil reported the following slate of officers: Presiding officer, Dr. Donal G. Myer; Program Officer, Dr. Paul Nollen; Secretary/Treasurer and Representative to American Society of Parasitologists, Dr. George Garoian.

It was moved, seconded and passed unanimously to accept the Committee Report.

There being no further business placed before this 33rd annual meeting a motion to adjourn was made, seconded and passed. Dr. Miller adjourned the meeting at 12 noon, 6 June, 1981.

Respectfully submitted,

George Garoian

George Garoian, Secretary/Treasurer

S = Student member

✓ Registered at meeting

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As of May 15, 1982

REGISTRATION AND ROOM REQUEST

ANNUAL MIDWEST CONFERENCE OF PARASITOLOGISTS--34

Western Illinois University

Macomb, Illinois

June 3,4,5, 1982

Name _____

Institution _____

Address _____

_____

_____ Zip _____

Guest Rooms, Corbin Hall

Rooms available 3:00 p.m., June 3, 1982	June 3rd	June 4th	Amount
$6.00 Double (room with _____)	( )	( )	_____
$8.00 Single	( )	( )	_____

Includes blanket, pillow, linen and towels. Conferees will make their own beds. Parking across the street from Corbin Hall.

Banquet Buffet 7:00 p.m. June 4th $7.50 each No ( ) _____
LaMoine Room WIU Union

Registration Fee $4.00 for members--$7.00 for non-members _____
(a real bargain compared to ICPA-V--$160 Can.)
TOTAL AMOUNT ENCLOSED _____

Make checks payable to AMCOP-34

Return completed forms with check to:

Paul M. Nollen, Program Officer
AMCOP-34
Dept of Biological Sciences
Western Illinois University
Macomb, IL 61455
Phone: Office 309-298-1359
Dept. 309-298-1546
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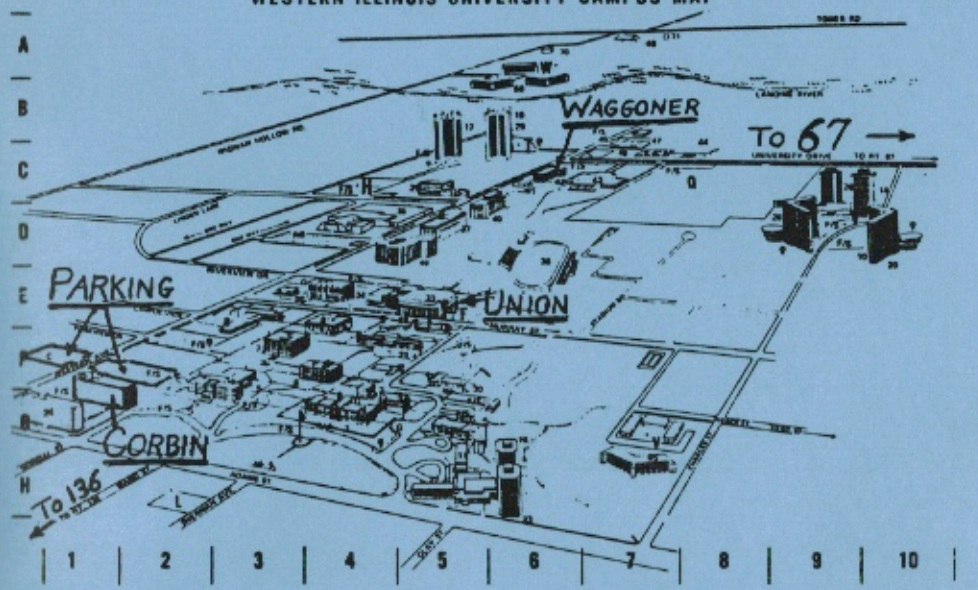
See Campus Map for Travel Directions to Macomb and the Campus.

NOTES

WESTERN ILLINOIS UNIVERSITY CAMPUS MAP



Macomb is located at the crossroads of U.S. Hwys 67 and 136. The campus is located on the northern edge of Macomb and can be reached by taking Hwy 67 (University Drive) north out of town. Those driving from the north should watch for the University Dr. turnoff about ½ mile past the Holiday Inn. Look for AMCOP signs. From U.S. 136 the campus can be reached from Normal Street or Western Ave. Train service to Macomb is limited to one AMTRAK each day which leaves Chicago at 5:55 p.m. and arrives in Macomb at 9:15 p.m. The train leaves for Chicago at 6:15 a.m. each day. For air travel, the nearest air service is at Peoria or Moline. If you play to fly, notify me in advance and arrangements will be made for meeting your plane.