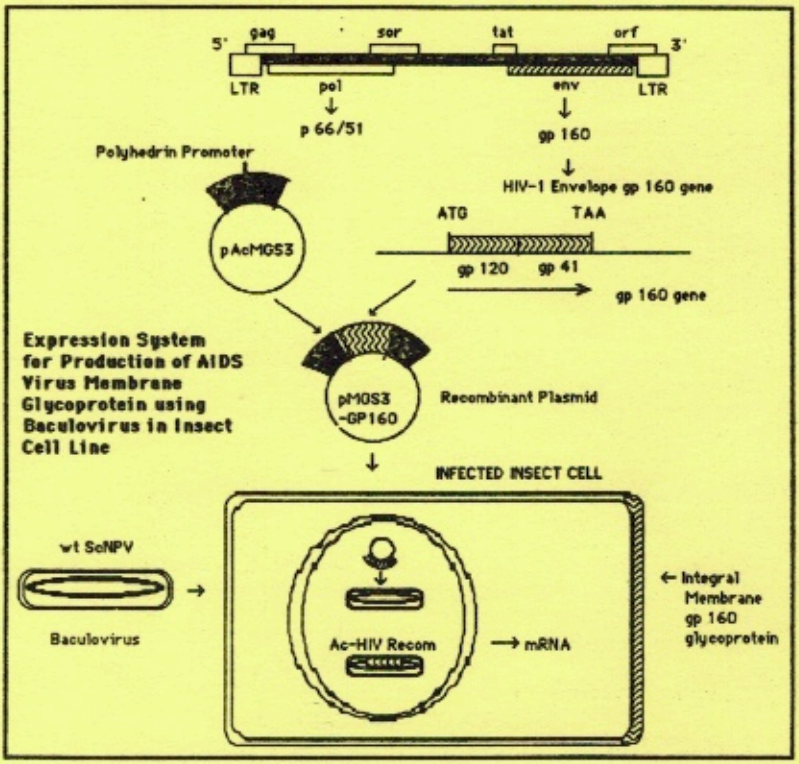
AMCOP XL

ANNUAL MIDWESTERN CONFERENCE OF PARASITOLOGISTS



PURDUE UNIVERSITY
WEST LAFAYETTE, INDIANA
JUNE 3 & 4, 1988
SYMPOSIUM:
HOST PARASITE GENETICS

AMCOP XL, 1988
Affiliate American Society of Parasitologists

CONTENTS

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ACKNOWLEDGEMENTS

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BRING THIS PROGRAM WITH YOU TO WEST LAFAYETTE

Purdue University
June 2-4, 1988
Program Schedule

THURSDAY, JUNE 2, 1988

1:00 - 12:00 PM	Check in at Young Graduate House
7:00 - 11:00 PM	Social gathering at Minchella Home

FRIDAY, June 3, 1988

8:00 - 11:00 AM	Registration - coffee, orange juice and donuts - Lilly Hall - (G-400 corridor)
9:00 - 9:15 AM	Welcoming remarks, Dr. Martha Chiscon, Assistant Dean of Science
9:15 - 11:30 AM	General Session, contributed papers Lilly Hall G-126
11:30 - 1:00 PM	Luncheon Break
1:00 - 3:00 PM	Symposium - Host-Parasite Genetics
Speakers:	Dr. Terry A. Dick, Department of Zoology University of Manitoba
	Dr. Joan K. Lunney, Animal Parasitology Institute U.S.D.A.
3:00 - 4:30 PM	Poster-Demonstration Section, Lilly Hall G-415
4:30 PM	Business Meeting, Lilly Hall, G-126
6:00 PM	Social Hour (cash bar) Morris Bryant Smorgasbord
7:00 PM	Banquet Buffet Morris Bryant Smorgasbord
Speaker:	Dr. William H. Coil, Department of Systematics & Ecology, The University of Kansas

SATURDAY, June 4, 1988

8:00 - 9:00 AM	Coffee, orange juice, asprin, and donuts, Lilly Hall Ground Floor (G-400 Corridor)
9:00 - 11:00 AM	General Session, contributed papers, Lilly Hall, G-126
11:00 AM	Business Meeting Lilly Hall, G-126

LIST OF DEMONSTRATIONS AND PAPERS

DEMONSTRATIONS

(• = Student Competition)

1. A comparison between dendritic and capsular protonephridial systems in Acanthocephala. T. T. DUNAGAN & D. M. MILLER, Southern Illinois University, Carbondale, IL 62901

2. *In vitro* culture of *Baylisascaris procyonis* and immunoblot analysis of larval ES antigens. W. M. BOYCE, B. A. BRANSTETTER & K. R. KAZACOS, Department of Veterinary Pathobiology, Purdue University, West Lafayette, IN 47907

3. Toxicity of human eosinophil granule proteins for larvae of several ascarid species. K. J. HAMANN, K. R. KAZACOS, W. M. BOYCE & G. J. GLEICH, Mayo Clinic and Foundation, Rochester, MN 55905, and Purdue University, West Lafayette, IN 47907

4. • Morphology of the female mite *Varroa jacobsoni* (Oudemans, 1904) an ectoparasite of honey bees. R. A. BAUTZ, Department of Biological Sciences, University of Wisconsin-Milwaukee, Milwaukee, WI 53201.

5. • Characterization of a proteinase secreted by *in vitro* cultures of *Ascaris suum* larvae. S. R. MORRIS, Department of Veterinary Pathobiology, Purdue University, West Lafayette, IN 47906

6. The Manter Laboratory on-line data storage system. M. H. PRITCHARD & R. R. MITSCHLER, Harold W. Manter Laboratory, University of Nebraska State Museum, Lincoln, NE 68588-0514

PAPERS

1. • Cytochemical localization of alkaline and acid phosphatase in several developmental stages of the tapeworm, *Hymenolepis diminuta*. D. A. LEIBY, Department of Zoology, Ohio State University, Colombus, OH

2. • Population ecology of *Gregarina acridiorum* (Leger, 1893) from two species of grasshoppers in Nebraska. R. R. MITSCHLER, H. W. Manter Laboratory and School of Biological Sciences, University of Nebraska, Lincoln, NE 68588-0514

3. Examination of three parks in the St. Joseph/Benton Harbor, Michigan area for the presence of *Toxocara* spp. ova. K. E. LUDLAM & T. R. PLATT, Department of Biology, Saint Mary's College, Notre Dame, IN 46556

4. Endohelminths of salmon from eastern Lake Michigan, with emphasis on *Echinorhynchus salmonis*. P. M. MUZZALL, Department of Natural Science, Michigan State University, East Lansing, Michigan 48824

5. Presence of the meningeal worm, *Parelaphostrongylus tenuis* (Nematoda: Metastrongyloidea), in white-tailed deer in northwestern Indiana. T. R. PLATT, Department of Biology, Saint Mary's College, Notre Dame, IN 46556

6. Trypanocidal activity of liposome encapsulated ethidium bromide. S. S. SRISKANDA & D. G. DUSANIC, Department of Life Sciences, Indiana State University, Terre Haute, IN 47807

7. Winter acclimation, survival and supercooling point depression in the bird flea, *Ceratophyllus idius* (Siphonaptera). D. P. SCHELHAAS, Department of Biology, U. S. Air Force Academy, Colorado Springs, CO 80840 and O. R. LARSON, Department of Biology, University of North Dakota, Grand Forks, ND 58202

8. Destruction and regrowth of testes in *Philopthalmus gralli*, an eyefluke of birds. A. VILATTE & P. NOLLEN, Department of Biological Sciences, Western Illinois University, Macomb, IL

9. Long-term study on the population biology of *Neascus pyriformis* (Trematoda: Diplostomidae) in the creek chub, *Semotilus atromaculatus*. A. D. JOHNSON, M. RAMOS, D. K. SPIEGEL & D. G. DUNLAP, Department of Biology, University of South Dakota, Vermillion, SD 57069

10. Detection of oocysts of *Cryptosporidium parvum* in naturally infected raccoons using an indirect immunofluorescent procedure. D. E. SNYDER, USDA-ARS, Animal Parasite Research Laboratory, POB 952, Auburn, AL 36831-0952

LIST OF DEMONSTRATIONS AND PAPERS

11. Occurrence of the trematode *Paracreptotrematina limi* in *Umbra limi* from northern Indiana. J. W. CAMP, Department of Biology, Purdue University North Central, Westville, IN 46391

12. Pathogenic micro-organisms and helminths in sewage products, Arabian Gulf, Country of Bahrain. O. M. AMIN, University of Wisconsin-Parkside, Kenosha, WI 53141

1 A COMPARISON BETWEEN DENDRITIC AND CAPSULAR PROTONEPHRIDIAL SYSTEMS IN ACANTHOCEPHALA. T.T. Dunagan and D.M. Miller, Southern Illinois University, Carbondale, IL 62901

Excretory systems of the protonephridial type are confined to members of the Oligacanthorhynchidae. At present the capsular design is confined to the following genera: *Echinopardalis*, *Nephlidiorhynchus*, *Oligacanthorhynchus*, *Pachysentis*, and *Prosthenorchis*. The dendritic design is found in *Oncicola*, *Neoncicola*, *Tchadorhynchus*, and *Macracanthorhynchus*. Although these excretory systems have been known in most cases for half a century, species continue to be described in these genera with little or no attention paid to the excretory systems. It is also clear that generic placement of some species is in conflict with the type of protonephridium. *Oligacanthorhynchus* (=*Hamanniella*) *microcephala* was originally described with a dendritic system but *Oligacanthorhynchus taenioides* was described with a capsular system. This type of fundamental disparity implies that placement of some of the members of this family need to be reevaluated. In the capsular type, the flame bulbs radiate from the surface of a capsule that empties into the excretory bladder. The flame bulbs do not branch or otherwise form arbor-like complexes. In contrast, the dendritic type has multiple branched flame bulbs that empty directly into the excretory bladder and no "capsular" intermediary exists.

2 In vitro culture of Baylisascaris procyonis and immunoblot analysis of larval ES antigens. BOYCE, W. M., B. A. BRANSTETTER & K. R. KAZACOS, Department of Veterinary Pathobiology, Purdue University, West Lafayette, IN 47907

Larvae of Baylisascaris procyonis were found to release a heterogeneous group of antigenic glycoproteins (excretory-secretory antigens) when cultured in vitro. Immunoblot analysis using larval ES antigens of B. procyonis, Toxocara canis and Ascaris suum revealed extensive cross-reactions with antisera developed in mice against 7 species of larval ascarids: (B. procyonis, B. columnaris, B. melis, B. transfuga, A. suum, T. canis, Toxascaris leonina). The greatest cross-reactivity to B. procyonis ES antigens occurred with antisera to Baylisascaris spp., A. suum, and T. leonina. Toxocara canis antisera cross-reacted weakly with B. procyonis ES antigens and did not recognize several antigens in the 30-43 kd range. With T. canis ES antigens, cross-reactions were noted against each of the heterologous ascarid species. Sera from rabbits either experimentally or naturally infected with B. procyonis larvae recognized similar B. procyonis ES antigens. Sera from T. canis-infected rabbits cross-reacted with the majority of the B. procyonis ES antigens except those having molecular weights between 39 and 43 kd. This group of antigens was also recognized by human sera from known or suspected cases of B. procyonis infection and may prove useful for the separation of larval Baylisascaris and Toxocara infections in man and animals.

3 Toxicity of human eosinophil granule proteins for larvae of several ascarid species. HAMANN, K.J., K.R. KAZACOS, W.M. BOYCE, & G.J. GLEICH, Mayo Clinic and Foundation, Rochester, MN 55905, & Purdue University, West Lafayette, IN 47907.

The association of eosinophils with helminthic infections has long been noted and the ability of eosinophils to kill parasitic worms in vitro is well-established. In our efforts to clarify the roles of eosinophil granule proteins and to investigate possible mechanisms of action, we have tested a variety of helminths and here report the results of assays of toxicity of these proteins for 5 species of ascarids, namely, Ascaris suum, Toxocara canis, Baylisascaris procyonis, B. melis and B.transfuga. Toxicity of major basic protein (MBP) for A.suum and Baylisascaris spp. was comparable to that for other helminths such as T.spiralis and Brugia spp. The 3rd stage ("post-molt") larvae of A.suum were the most susceptible targets while the 2nd stage (artificially hatched) larvae of T.canis were the most resistant. Even at the highest levels (1x10-4 M) of MBP only about 7% of the worms were killed even after 126 hrs. Eosinophil peroxidase was toxic in its own right as previously shown with microfilariae of Brugia spp. Eosinophil cationic protein and eosinophil-derived neurotoxin killed only A. suum larvae at high rates although ECP did cause significant mortality of "post-molt" larvae of B. procyonis after 48 hrs. Results of these assays and recent results of assays using Mesocestoides corti tetrathyridia as targets yield intriguing differences in susceptibility to these proteins. However, relating such results to possible mode(s) of action remains speculative.

4 Morphology of the female mite Varroa jacobsoni (Oudemans, 1904) an ectoparasite of honey bees. BAUTZ, RICHARD A., Department of Biological Sciences, University of Wisconsin-Milwaukee, Milwaukee, Wisconsin 53201.

Within the last 25 years the mite Varroa jacobsoni has become the major problem facing apiculture worldwide. An obligate parasite of honey bees, the mite evolved with the Asian bee Apis cerana and has virtually no harmful effects on the hive. However, the mite has demonstrated severe pathological effects on the European bee, A. mellifera, the most widely used bee species in the U.S. Scanning electron microscopy revealed that the female mite has an oval-shaped, flattened idiosoma, approximately 1mm long by 1.6mm wide. The idiosoma is covered with branched setae and has 20-25 thick horn-like setae along the lateral edges. The legs can be completely concealed beneath the highly sclerotized iodiosoma. Each leg has a powerful pretarsal sucker empodium well suited for clinging to the bee host. The respiratory system includes an external air sac, or peritremal tube, that can be inflated. The ventral surface is made of sclerotized plates covered with setae. Mouthparts are designed for piercing and sucking. V. jacobsoni is equally adapted for phoretic behavior or concealing itself between the sclerites of the host as it takes a meal of hemolymph.

5 Characterization of a Proteinase Secreted by in vitro Cultures of Ascaris suum Larvae.
MORRIS, S.R., Department of Veterinary Pathobiology, Purdue University, West Lafayette, IN 47906

Proteinases have been proposed to be involved in the nutrition and migration of parasites, as well as their evasion of the host's immune response. In order to investigate the role played by secreted proteinases of A.suum, proteins were isolated from in vitro cultures of larvae. These proteins were separated by electrophoresis through polyacrylamide gels containing gelatin as a proteinase substrate. After electrophoresis, the gels were incubated for 24 hours in one of four buffers (pH 4.0, 5.5, 7.0, or 8.5) with or without 2-mercaptoethanol and then stained with Coomassie blue. The areas where proteolytic activity had degraded the gelatin did not stain and formed clear bands against a blue background thus identifing proteinases while simultaneously providing values of their apparent molecular weights. Two proteinases have observed with approximate molecular weights of 200 kDa and 50 kDa. Both are most active at pH 4.0 and are dependent on a reducing agent for activation. Because the 50 kDa was observed only after electrophoresis under reducing conditions, it may be that it represents a subunit of the 200 kDa proteinase.

6 The Manter Laboratory On-Line Data Storage System. PRITCHARD, M.H. and R.R. MITSCHLER. Harold W. Manter Laboratory, University of Nebraska State Museum, Lincoln, NE 68588-0514

The Computerized Specimen data system at HWML permits unlimited data storage and retrieval by any combination of 23 fields. Data for the Photograph Collection is retrievable by any combination of 11 fields. Specimen data printouts by Parasite, Host and Locality will be available for examination, as well as a printout of the Photograph data.

1

Cytochemical localization of alkaline and acid phosphatase in several developmental stages of the tapeworm, Hymenolepis diminuta. D.A. LEIBY, Department of Zoology, Ohio State Univ., Columbus

The activities of alkaline and acid phosphatase (AlPase and AcPase, respectively) were localized cytochemically in excysted scoleces and adults of Hymenolepis diminuta, using cerium as the capture agent. Additionally, AcPase was localized in 3-day-old worms. Cytochemical reactions for AlPase and AcPase activities were performed at pH 8.0 and 5.0, respectively. The substrate used in these reactions was ß-glycerophosphate, which was omitted from controls. Adult worms of H. diminuta demonstrated considerable AcPase and AlPase at the brush border, and appeared virtually indistinguishable. Excysted scoleces, however, demonstrated AlPase comparable to that of adults, while AcPase was negligible. AcPase, however, also was observed in 3-day-old worms, but at levels below that demonstrated by adult worms. These results suggest that AlPase may play an important nutritional role, and is therefore, needed immediately upon excystation. AcPase, however, is not essential until later developmental stages in which it demonstrates a continuum of development. The function of AcPase remains speculative, but it may be important for nutrition in acidic portions of the rat small intestine.

2

Population ecology of Gregarina acridiorum (Leger, 1893) from two species of grasshoppers in Nebraska. MITSCHLER, R.R., H.W. Manter Laboratory and School of Biological Sciences, University of Nebraska, Lincoln, NE 68588-0514

Specimens of Gregarina acridiorum were collected from Mermiria bivittata (Serville) and Melanoplus confusus Scudder during two summers in the Nebraska Sandhills. These grasshoppers were selected because their different feeding habits and behavioral ecology were hypothesized to influence parasite transmission. Examples of some ecological factors measured are host feeding heights, diet breadth, and movement patterns. Parasite population parameters were estimated and compared to test the hypothesis. The distributional parameter estimates responded in a complex manner to the ecological factors, with no one factor emerging as the predominate one. The gregarines exhibit considerable morphometric variation, and the lack of morphological characters has influenced the complex systematics of the group.

3

Examination of three parks in the St. Joseph/Benton Harbor, Michigan Area for the presence of Toxocara spp. ova. LUDLAM, K. E. & T. R. PLATT, Department of Biology, Saint Mary's College, Notre Dame, IN 46556

Soil samples, collected from three public parks in the Saint Joseph/Benton Harbor, Michigan area, were examined for the presence of Toxocara spp. ova. The parks were chosen on the basis of different physical characteristics. Napier Park, in Benton Harbor, is a small neighborhood playground exhibiting a relatively low level of maintenance by city employees. Milton Park is located in an older residential area of St. Joseph with some commercial development. It is extremely well-kept, and has prominent signs prohibiting dogs. Corronde Park, in Benton Harbor, is the largest of the three parks, and receives excellent care. Dogs are permitted but must be on leashes or chained. A total of 114 soil samples was collected and examined for ova following the methods of Kazacos (1983). Twenty two samples (19%) contained Toxocara spp. ova. No ova were found in Milton; however, 31 and 34% of samples from Napier and Corronde were positive, respectively. Mean density of ova from these areas was low, however two samples from Corronde had densities of 3.4 and 5.5 (per 5 gm of soil), sufficient to result in human infection.

4

Endohelminths of Salmon from eastern Lake Michigan, with emphasis on Echinorhynchus salmonis. MUZZALL, P. M. Department of Natural Science, Michigan State University, East Lansing, Michigan 48824.

Adult salmonids (101 chinook salmon, Oncorhynchus tshawytscha; 7 coho salmon, O. kisutch; 56 lake trout, Salvelinus namaycush; 6 steelhead, Salmo gairdneri; and 2 brown trout, Salmo trutta) were collected from eastern Lake Michigan (Ludington and Manistee, Michigan) in July-September 1986, and examined for helminths. Eight species (3 Cestoda, 3 Nematoda, 2 Acanthocephala) were found in the digestive tract and other viscera. Echinorhynchus salmonis and Eubothrium salvelini were the most common helminths found.

5 Presence of the meningeal worm, Parelaphostrongylus tenuis (Nematoda: Metastrongyloidea), in white-tailed deer in northwestern Indiana. PLATT, T.R., Department of Biology, Saint Mary's College, Notre Dame, IN 46556

Parelaphostrongylus tenuis is a common parasite of white-tailed deer (Odocoileus virginianus)in eastern North America. Fresh fecal samples were collected from 129 hunter-killed deer during the 1986 and 1987 hunting seasons from the Kingsbury Fish and Wildlife Area, Laporte County. Feces were examined using a modified Baermann technique. Forty nine samples (38%) were positive for larvae identical to those of P. tenuis. All age classes of deer (fawns, yearlings and adults) were infected. The number of larvae per gram of feces ranged from 0.2 to 498. Adults of P. tenuis were found in three of nine heads examined. The infective stage (L3) of P. tenuis was found in field collected molluscs from Kingsbury during the summer of 1987. Fourteen species of slugs and snails were examined by artificial digestion or by pressing the animal between glass slides after removal of the shell. Cochlicopa sp. (1/18), Deroceras laeve (1/32), and Discus cronkhitei (2/189) were positive for P. tenuis larvae. Although the presence of P. tenuis in Indiana has been demonstrated, the presence of related metastrongyloids, Parelaphostrongylus andersoni and Varestrongylus alpenae cannot be discounted.

6 Trypanocidal activity of Liposome encapsulated Ethidium Bromide.

SRISKANDA, S.S., & D.G. DUSANIC, Department of Life Sciences, Indiana State University, Terre Haute, IN 47807

Ethidium bromide (EtBr) was encapsulated in liposomes made from egg-yolk-derived phosphatidyl choline (lecithin), phosphatidyl ethanolamine and cholesterol. EtBr containing liposomes, made by an extrusion method were incubated with Trypanosoma musculi growing in tissue culture medium at 37°C. The growth of the trypomastigotes was monitored to evaluate the effectiveness of liposome-drug preparations. EtBr containing liposomes when compared to unencapsulated EtBr in phosphate buffered saline, required about half the time period to eliminate all the tryponastigotes. Incorporation of positively charged molecules such as stearylamine into the liposomal membrane further augmented the trypanocidal activity.

7 Winter Acclimation, Survival and Supercooling Point Depression in the Bird Flea, Ceratophyllus idius (Siphonaptera). SCHELHAAS, D. P., Department of Biology, U.S. Air Force Academy, Colorado Springs, CO 80840 and O. R. LARSON, Department of Biology, University of North Dakota, Grand Forks, ND 58202.

Ceratophyllus idius parasitizes several species of North American swallows, including purple martins (Progne subis). Nests of such birds contain numerous fleas which remain after autumn migration of hosts. Parasite survival depends on a physiological strategy of freeze avoidance, primarily through production of glycerol as a cryoprotectant. In early autumn of 1984 and 1985, about 10,000 fleas were collected from martin houses in the Grand Forks area. After controlled cooling (3°C every 4th day) to 1°C, these were divided into two regimens: 1) an artificial "winter" (-6°C freezer) and 2) ambient outdoor (roof-top) conditions. Samples from each were analyzed periodically. Despite winter mortality, almost 1/3 of the outdoor population was alive 7-10 days prior to the expected return of birds in late April. A small percentage was still alive in mid-May. Supercooling points (SCP) were determined during chilling and at intervals throughout the fall and winter. In both regimens, the flea SCP paralleled glycerol accumulation, with the SCP stabilizing at -29° to -30°C, a temperature close to the winter minima in eastern North Dakota. Winter survival of this flea in its northernmost range (the Alaskan interior) suggests the existence of a north-south physiological cline, one which probably is maintained through natural selection and limited gene flow.

8 Destruction and regrowth of testes in Philophthalmus gralli, an eyefluke of birds. ALAIN VILATTE & PAUL NOLLEN, Dept of Biological Sciences, Western Illinois University, Macomb, IL

The ability of digenetic trematodes to regenerate complete body parts and organs is almost nonexistent when compared to turbellarians. Outside of wound healing, they have little regenerative ability. Reproductive organs are the most sensitive tissues to suboptimal conditions and are the first to be reabsorbed or destroyed. Exposure of adults to deionized water over a period of time will disrupt the testes. The course of this destruction and possible regrowth was the object of this study. Gravid adult P. gralli from chickens were subjected to deionized water and 0.85% saline at 3 C and 22 C. Samples were removed at hourly intervals for 6 hr, fixed, processed for paraffin sections, and stained with H & E. Some worms were treated with deionized water at 22 C for 3 hr and warmed for 2 hr at 39 C before transplanting to chicken's eyes. These worms were harvested at daily intervals for 10 days and prepared for paraffin sections. Disruption of testes in worms treated at 22 C with deionized water was complete by 3 hr. Stages of spermatogenesis were unrecognizable and the entire testis was vacuolated. Worms in which testes were destroyed that were transplanted showed regrowth of normal testicular tissue by 2 days. Tissue renewal started at the periphery and, after 10 days, was complete.

9 Long-term study on the population biology of Neascus pyriformis (Trematoda: Diplostomidae) in the creek chub, Semotilus atromaculatus. JOHNSON, A.D., M. RAMOS, D.K. SPIEGEL & D.G. DUNLAP, Department of Biology, University of South Dakota, Vermillion, SD 57069

The population biology of the black spot trematode N. pyriformis was studied in the creek chub in a small creek in South Dakota during the fall months over a 6-yr period (1978-83) and seasonally over one 7-mo period (1980). Prevalence, mean density and variance to mean ratio of the cysts varied over the 6-yr period; these variations corresponded to changes in annual precipitation. Most striking was the increase for all 3 parameters from 1978-1979, and the decrease in prevalence and mean density and increase in variance to mean ratio from 1982 to 1983. It is suggested that the higher water level of the creek in 1979, resulting from above normal precipitation, increased snail habitat and ultimately enhanced the rate of black spot recruitment. However, extensive flooding in 1983 produced by above normal precipitation was concomitant with a lower recruitment rate in the 0+ fish and the apparent displacement of the 1+ fish. In all annual and monthly samples the variance was considerably greater than the mean, indicating overdisperion of the cysts among the fish hosts. Prevalence remained high for all 7 mo of 1980, while mean density showed a pattern of decline. There was a gradual drop in recruitment in both 0+ and 1+ fish during the 7 mo, and this correlated with below normal precipitation in 1980.

10 Detection of oocysts of Cryptosporidium parvum in naturally infected raccoons using an Indirect Immunofluorescent Procedure. DANIEL E. SNYDER, USDA-ARS, Animal Parasite Research Laboratory, POB 952, Auburn, AL 36831-0952.

Fecal samples from 100 wild raccoons were examined for the presence of oocysts of Cryptosporidium parvum using a commercially available indirect immunofluorescent detection procedure. Thirteen (13%) of the samples were positive for oocysts of this protozoan parasite. Over 61% of the infected samples contained moderate to large numbers of oocysts of this parasite. Raccoons may serve as potential reservoirs for transmission of infection of C. parvum to other mammalian hosts, including man.

11 Occurrence of the trematode Paracreptotrematina limi in Umbra limi from northern Indiana. CAMP, J.W. Department of Biology, Purdue University North Central, Westville, IN 46391.

Mudminnows from a northern Indiana creek were examined for Paracreptotrematina limi. One hundred twenty three mudminnows were collected from April 1987 through April 1988. Of these 38 (31%) were infected with P. limi. One hundred thirty six worms were recovered (range 1-58). The mean intensity of infection and standard error were 3.6 ± 1.5. P. limi exhibited seasonal maturation. This is the first report of P. limi from Indiana.

12 Pathogenic Micro-organisms and Helminths in Sewage Products, Arabian Gulf, Country of Bahrain. AMIN, OMAR M., University of Wisconsin-Parkside, Kenosha, WI 53141

Fecal and sludge samples from the Arabian Gulf country of Bahrain contained poliomyelitis and coxacki viruses, coliform bacteria, Escherichia coli, Salmonella spp., Shigella sonni, fecal streptococci, Balantidium coli, Ascaris lumbricoides and Hymenolepis nana eggs, and Strongyloides stercoralis. Sludge produced in the central sewage treatment plant is used for agricultural purposes and poses a threat to public health. Recommendations to reduce the potential health hazards are made.

NOTES

SECRETARY'S REPORT FOR AMCOP-39

The 39th AMCOP conference was held on the campus of the Southern Illinois University at Edwardsville, Edwardsville, Illinois on 6-7 June, 1987 with 64 persons registered for the conference and an organizational membership of 130. Dr. Paul M. Nollen of Western Illinois University, Macomb, IL was presiding officer of the meeting and Dr. Donal Myer, Southern Illinois University at Edwardsville made local arrangements. Ten demonstrations and eleven papers were presented by members. The C.A. Herrick Award (and $200.00) for a demonstration entitled "Cytochemical localization of phosphatase activities in cysticercoids and excysted scoleces of the tapeworm, *Hymenolepis dinunita*" was awarded to David A. Leiby, Department of Zoology, The Ohio State University, Columbus, Ohio. The G.R. LaRue Award (and $200.00) for a paper entitled "The effect of *Plagiorhynchus cyindraceus* (Acanthocephala) infection on the acquisition and use of energy by starlings (*Sturnus vulgaris*)" was awarded to Vincent A. Connors, School of Biological Science, University of Nebraska, Lincoln, NE.

A symposium entitled "Modern Systematics in Parasitology" was presented by two speakers. Dr. Ralph Lichtenfels, Animal Parasite Institute, USDA, spoke on "Four examples of newer methods in taxonomy" and Dr. Mary Beverly-Burton, University of Guelph, Canada spoke on "Modern Systematics of Some Fish Parasites". The banquet speaker was Dr. Kevin R. Kazacos, Department of Veterinary Microbiology, Pathology and Public Health, Purdue University, West Lafayette, IN, who spoke on "Bayliscarid nematodes--Their biology and role in larva migrans disease".

Officers elected for 1987-88 were as follows: Presiding Officer: George Garoian, Department of Zoology, SIU at Carbondale, Carbondale, IL (618)-536-2314. Co-Program Officers: Kevin R. Kazacos, Department of Veterinary Microbiology, Pathology and Public Health, Purdue University, West Lafayette, IN. (317)-494-7556 and Dennis J. Minchella, Dept of Biological Sciences, Purdue University, West Lafayette, IN (317)-494-8188. The Secretary/Treasurer of AMCOP, Dr. Donald M. Miller, Department of Physiology, SIU-Carbondale, Carbondale IL (618)-536-5513 was reelected for the two year period 1987-89.

Dr. William Coil suggested, and the membership accepted, the formation of a series of book sales at AMCOP. The first of these will

SECRETARY'S REPORT FOR AMCOP-39

be held at AMCOP-40. Dr. H. Zaiman, Mercy Hospital, Valley City, SD donated two slides of parasites to each member of AMCOP.

AMCOP-40 will be held at Purdue University, West Lafayette, Indiana in early June of 1988. Future meeting sites are AMCOP-41; Miami University, Oxford, OH and AMCOP-42; University of South Dakota, Vermillion, SD. Suggested symposia themes for ensuing meetings were: (1) Hyperparasitism (2) Epidemiology (3) Parasitic Ecology (4) Genetically-engineered vaccines (5) Host-parasite genetics.

Committees appointed by Presiding Officer Nollen were:

Nominating Committee:	Dan Snyder Bill Coil
LaRue Committee:	Peter Pappas Omer Larson
Herrick Committee:	John Crites Gary Uglem
Meeting Site Committee:	Tom Dunagan David Daniell
Symposium Committee:	Dennis Minchella Patrick Muzzall
Resolutions Committee:	Jerry Hubschman Frank Etges
Auding Committee:	Mel Denner Allen Johnson

AMCOP-39 TREASURERS REPORT FOR 1986-87

	AMCOP-39 1987
BALANCE ON HAND 6 JUNE 1986	1,557.64
INCOME	
MEMBERSHIP DUES:	
Pv Yr Mbrshps*	$51.00
Reg Mbrshps	$297.00
Stu Mbrshps	$34.00
Nxt Yr Mbshps	$3.00
INTEREST:	
CDT UNION	$109.33
ELI LILLY DONAT	$200.00
AEF Found	$97.00
LA RUE DONATIONS:	$268.27
SIUC SCH MED	$470.00
CD INTRST	0
MISCELLANEOUS:	
SUBTOTAL:	1,529.60
EXPENSES	
Programs	200
Postage	270
Envelopes	
Off Supp	10.27
Herrick Award	200
LaRue Award	200
Miscellaneous	1500
Reid Check	10
Mo Mtg Exp*	48
SUBTOTAL:	2438.27
BALANCE ON HAND 8 JUNE 1987:	648.97
ASSETS:	
CDT UNION SHARES	25
VALUE OF CD (UNIV BK)	1,027.63
VALUE OF CD (CDT UNION)	1,500.00
TOT. NET WORTH TO DATE	3201.6

AMCOP 39 (1986-87) FINANCIAL SUMMARY

AUDITED BY: DATE:

AUDITED BY: DATE: 6/5/87

REPORT OF RESOLUTIONS COMMITTEE

June 7, 1987

Whereas, The 39th Annual Midwest Conference of Parasitologists (AMCOP) met at the University of Southern Illinois Edwardsville on June 6th and 7th, 1987, and

Whereas, The meeting was an unqualified success and enjoyed by all, and

Whereas, The success of the meeting was a result of the contributions of many individuals and organizations, and

Whereas, The membership of AMCOP wishes to acknowledge those contributions, therefore be it

RESOLVED that we recognize with thanks the following:

1. Dr. Donal G. Myer as program officer for his careful and thorough preparation for the meeting, and to Don and Rosemary for inviting us to their home.

2. Dr. Don M. Miller for editing and producing a quality program, for the extensive correspondence, and for the management of the financial affairs of our group.

3. Dr. Paul M. Nollen for his skillful and expedient chairing of the meeting.

4. Drs. Mary Beverley-Burton and J. Ralph Lichtentels, our symposium speakers, for providing stimulating lectures on the subject of modern systematics in parasitology.

5. Dr. Keven Kazacos, after dinner speaker, for an informative and thorough presentation on *Baylisascaris* nematodes.

6. The Eli Lilly Co. for again supporting the Herrick Award and the anomymous donors for the LaRue Award.

7. The University of Southern Illinois Edwardsville for providing facilities for our meeting and especially to Dr. Barbara Teter, Vice President and Provost, for her warm and cordial welcoming remarks to our group.

Respectfully submitted

Jerry H. Hubschman

Frank J. Etges

THE ANNUAL MIDWESTERN CONFERENCE OF PARASITOLOGISTS

(AMCOP)

Objectives and Organization

A restatement to incorporate changes approved in 1986. Earlier statements have been approved in 1948, 1953, 1971, 1972, 1973, and 1974.

Name

The organization shall be known as the ANNUAL MIDWESTERN CONFERENCE OF PARASITOLOGISTS (AMCOP), hereinafter referred to as the Conference.

Affiliation

The conference is an affiliate of the American Society of Parasitologists.

Objectives

The Conference is a gathering of parasitologists and students of parasitology for the purpose of informal discussion of research and teaching in parasitology and the furthering of the best interests of the discipline of parasitology.

Members

The Conference is open to all interested persons regardless of place of work, residence, or affiliation in other recognized societies. There are three categories of membership: Emeritus, Regular, and Student.

When a member retires from industry, university or other professional occupation, that person shall be eligible for emeritus membership.

Dues

Annual dues are required for emeritus, regular and student membership. A registration fee is charged during registration at annual conferences. The amount of this fee will be decided for each Conference by a committee composed of the Presiding Officer, the Secretary/Treasurer, and the Program Officer, who is to serve as its chair. Dues are established by the Policy Committee and collected by the Secretary/Treasurer.

Meetings

The Conference is held in the general midwestern area during early to mid-June, unless otherwise specified by a majority vote of the previous Conference or a majority vote of those listed members replying by mail ballot.

Bylaws

1. Simple majority vote of members in attendance at regularly scheduled meetings of the Conference shall determine the policies of the Conference.

2. The officers are a Presiding Officer, whose term of office is one year or until a successor is elected (normally the term expires with adjournment of the annual Conference over which the person presides); a Secretary/Treasurer, whose term of office is two years or until a successor is elected; a Program Officer whose term of office is one year; and a Policy Committee composed of the last five available retired Presiding Officers plus, ex officio and without vote, the current Presiding Officer and Secretary-Treasurer. All terms of office begin at the conclusion of the Conference in which the person was elected. The term of office of each full member of the Policy Committee is five years, or so long as the person is one of the five most recent, available Presiding Officers. The most recent past Presiding Officer available chairs the Policy Committee and is the Vice-President Officer of the current Conference.

3. The Presiding Officer, the Secretary/Treasurer, and the Program Officer are elected by a majority vote of those members attending a regularly scheduled business meeting of the Conference or by a majority vote of those replying to a mail ballot of the membership.

4. The Presiding Officer shall preside at all meetings of the Conference and shall arrange for a banquet speaker.

On the first day of a Conference the Presiding Officer shall appoint the following committees, which shall serve until they have reported on the last day of the annual Conference: (1) Nominating Committee, (2) Committee to Recommend Future Meeting Places, (3) Committee to Suggest Program Possibilities for Future Meetings, (4) Resolutions Committee, (5) Judging Committee, (6) Audit Committee and such other ad hoc committees as may be required.

The Presiding Officer shall appoint the Conference Representative to the Council of the American Society of Parasitologists for the year who must be a member of that society.

The current Presiding Officer serves as a member without vote of the Policy Committee.

5. The Secretary-Treasurer shall issue annual dues notices and about four months prior to each Conference a call for participants in the

program for each Conference; inform the new Presiding and Program Officers concerning duties and the members of the Policy Committee of their tenure and the Secretary of the American Society of Parasitology within three weeks after the annual election; serve as members without vote and the Secretary of the Policy Committee; and supervise all funds of the Conference.

6. The Program Officer shall be responsible for the general format of the Conference and for arranging suitable facilities and funding. It shall also be this person's responsibility to chair the special committee to determine and collect the registration fee for the Conference. The format of the Conference may vary, but should include both a demonstration session and a session of contributed papers both open to all members. A symposium may also be included, or may replace a session of contributed papers.

7. The Policy Committee shall determine by majority vote all matters of procedure and policy pertaining to the Conference upon which decision must be reached between consecutive Conferences, as well as all matters referred specifically to it by the membership. Such a vote may be requested by any member of the Conference but must be directed through the Secretary/Treasurer. The Chairperson of the Policy Committee shall request approval by the membership for all decisions of the Committee at the earliest subsequent business meeting of the Conference.

Problems, Solutions and Opportunities in the Systematics of Nematodes of Large Food Animals

J. Ralph Lichtenfels
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Three examples were discussed.

1) *Haemonchus*: Recently discovered characteristics of the synlophe (pattern of longitudinal ridges on the surface of the cuticle) and isoenzyme differences indicate that *H. contortus* of sheep and *H. placei* of cattle are separate species. A comparison of genomic DNA of the species is planned.

2) *Ostertagia*: Ten species in *Ostertagia* and its close relatives *Teladorsagia* and *Marshallagia* cause significant losses in cattle, sheep and goats in North America. Recent studies of newly discovered morphological characteristics of these nematodes support a proposal that 5 of 10 species are secondary morphotypes (in parentheses following their primary morphotype) as follows: *Osteriragia ostertagi* (*O. lyrata*); *Teladorsagia circumcincta* (*T. trifurcata, T. davtiana*); *Marshallagia marshalli* (*Ostertagia occidentalis*); *Ostertagia bisonis*.

3) *Trichinella*: Morphological, biochemical and genetic data was presented to support the conclusion that a spillover of infections from the domestic biotype (swine farms and waste disposal sites) into wildlife species has occurred. But, although man and swine can be infected with *Trichinella* of the type that cycles in wildlife species, those genetic types apparently have not been transferred to swine on the farms. The development of DNA probes for the only genetic type of *Trichinella* known to cycle on swine farms has provided a useful tool for diagnosis and further study of the epidemiology of *trichinellosis*. Further study of the DNA of genetic types of *Trichinella* (including gene sequencing) should add to our understanding of its evolution and epidemiology.

The continued application of a combination of classical phenetic and modern genetic methods to problems in systematics will continue to provide solutions to important problems.

Phylogeny Reconstruction and Co-evolutionary History of the Nearctic Ancyrocephalidae (Monogenea)

M. Beverly-Burton
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Historically, it is evident that many of the difficulties arising in taxonomic studies of the ancyrocephalids of North American freshwater fishes are associated with a lack of good generic definition.

As a preliminary to cladistic analysis 19 characters (14 binary and 5 multistate) were identified from a study of 100 ancyrocephalid species which are considered valid and for which morphologic data were available. Polarization was achieved by the outgroup analysis and out group substitution techniques described by Madison *et al.* (1984) and Donaghue and Cantino (1984) respectively using generalized forms (based on type species morphology) of *Entobdella, Gyrodactylus* and *Tetraonchus*. Character transformation series were made on an *a priori* basis and the analysis was conducted on an IBM Personal Computer using PAUP.

Taxa previously identified as monophyletic were included in the analysis as single terminal taxa and include ancyrocephalids with articulating haptoral bars (see Beverly-Burton 1986 - 15 spp. in 6 genera), *Ligictaluridus* (5 spp.) and *Onchocleidus* (sensu Wheeler, 1988 to include *Haplocleidus* and *Pterocleidus* - 24 spp.). Preliminary analysis readily isolated three other monophyletic assemblages namely the genera *Aethycteron* (11 spp.), *Lyrodiscus* (5 spp.) and *Salsuginus* (6 spp.). Three other genera (*Leptocleidus, Macrohaptor* and *Tetracleidus*) were recognised as being monotypic. Four paraphyletic assemblages, lacking any shared derived characters, appeared and were provisionally named as "*Aristocleidus*" (9 spp.), "*Cleidodiscus*" (11 spp.), *Urocleidus* 1 (*Urocleidus* sensu Beverly-Burton, 1984 - 4 spp.) and *Urocleidus* 2 (4 spp.).

The most parsimonious cladogram (50 steps with a consistency index of 0.74) supports the monophyletic status of the nearctic Ancyrocephalidae and the group designated as "*Aristocleidus*" appears as the sister group to the other ancyrocephalid species. Three trichotomies were apparent - two of which were associated with the paraphyletic assemblages noted above. Using previously published cladograms for the major fish taxa which are parasitized by the nearctic ancyrocephalids it was evident that co-speciation has not occurred and thus, transfer by ecological association may have been the key factor in the present distribution of parasites. Having recognised the monophyly of the nearctic Ancyrocephalidae the biogeographic aspects of several possible ancestral host taxa are discussed.

Parasite Genetics

Terry A. Dick
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Biological variability or genotypic variation is essential for the survival of a species of parasite and for its transmission. There is ample information on pathotypes, serotypes, and zymodemes, and a number of theoretical papers have discussed host-parasite genetics, primarily from the genetic perspective of the host. What little we know about the host-parasite interaction has been largely derived from the gene-for-gene hypothesis as it applies to plant pathogens. There is little empirical data from natural parasite populations documenting genetic heterogeneity and little effort dedicated to documentation of quantitative traits i.e., mass, size, fecundity. Indeed it is difficult to obtain data on life-time fecundity of an individual or of a population of parasites. I believe there are two important genetic problems relating to parasites. (1) How do we assess genetic heterogeneity in natural populations and how does it relate to life history strategies? (2) What methods are available to assess genetic heterogeneity among individuals and populations and how is this information used, other then for taxonomic purposes?

To explain point one I will use as examples *Raphidascaris acus* (nematode) and *Triaenophorus crassus* (tapeworm); both parasites have an annual life cycle and are found in the intestine of northern pike (*Esox lucius*). The traits measured are mass, size, and fecundity and the factors effecting them are crowding, temperature, time and fish host. To develop the second point *Trichinella spiralis* will be used. I will look at biological characteristics, host-parasite interactions in mice (an indirect assessment of antigenic differences), and the importance of the intergenic spacer region in ribosomal DNA to assess individual and population variability.

Analysis of Primary and Secondary Responses of SLA Inbred Swine to *Trichinella spiralis* Reveals a Previously Unreported Elimination of Encysted Muscle Larvae

Joan K. Lunney
Animal Parasitology Institute, U. S. D. A.

Immunity to *T. spiralis* is readily established in most species. In mice, it has been demonstrated that genes of the major histocompatibility complex (MHC) are involved in regulating the magnitude of these anti-parasite responses. We have used MHC defined NIH minipigs to determine whether similar effects are exerted in swine. In this talk I will first review the sturucture of the MHC and the importance of these genes in regulating B cell and T cell immune responses as evidenced recently by the problems with the malarial vaccine. I will then discuss the differences between rodents and swine in their responses to *T. spiralis* inoculation. With this background I will then present our work on the use of the three lines of SLA inbred NIH minipigs, SLA $^{a/a}$(aa), cc, and dd, to assess the genetic control of swine immune responses to this helminth. As expected, a primary incoulation with 300 *T. spiralis* muscle larvae (ML) induced a high level of protection against a challenge of 10,000 ML in pigs of all three SLA haplotypes. However, aa pigs that had received both a pirmary and a secondary dose of ML exhibited a highly significant reduction in encysted ML from primary infection, when compared with the unchallenged, infected aa controls ($P<0.0003$). To date, protective immunity against *T. spiralis* has been associated with the intestinal and migratory phases of this parasite; removal of encysted ML has been demonstrated only using certain anthelmintics at high doses. In contrast, our results support the existence of an SLA-associated, host-mediated immune mechanism against encysted *T. spiralis* ML.

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SUMMARY OF AMCOP MEETINGS 1949-PRESENT

Year — Meeting Site — Presiding Officer
Banquet Speaker & Title **PO**=Program Officer, **ST**=Secy/Treas.
H=Herrick Award **L**=LaRue Award **S**=Symposium Title

1949 Univ. Wisconsin, Madison (AMCOP I) — H. J. Van Cleave
J. C. Baer

1950 Univ. Michigan, Ann Arbor (II) — R. V. Bangham
W. W. Cort, Trends in Helminthological Research

1951 Purdue Univ., Lafayette, Ind (III) — L. O. Nolf
J. E. Ackert, Some Observations on Hookworm Disease
ST=W. Balamuth

1952 Univ of Illinois, Urbana, Ill (IV) — R. J. Porter
A. C. Walton, **ST**=W. Balamuth

1953 Iowa State College, Ames Ia (V) — C. A. Herrick
R. M. Cable, Parasitological Experiences in Puerto Rico
ST=W. D. Lindquist

1954 Michigan State Univ, East Lansing, MI (VI) — A. C. Walton
G. F. Otto, Mosquitos, Worms, Somoans, and the Parasitologist in Samoa **ST**=W. D. Lindquist

1955 Notre Dame Univ, (VII) — R. M. Cable
G. R. LaRue, Relationships in the Development of Digenetic Trematodes **ST**=W. D. Lindquist

1956 Univ. of Iowa, Iowa City, IA (VIII) — W. D. Lindquist
W. H. Headlee, **ST**=F. J. Krudenier

1957 Univ. of Michigan, Ann Arbor, MI (IX) — J. E. Ackert
A. C. Chandler **ST**=F. J. Krudenier

1958 Kansas State University, Manhattan, KA (X) — G. R. LaRue
H. W. Manter, Trematodes of Many Waters **ST**=F. J.Krudenier

1959 Northwestern Univ., Evanston, IL (XI) — G. F. Otto
H. Van der Schalie, Contrasting Problems in Control of Schistosomiasis in Egypt and the Sudan **ST**=D. T. Clark

1960 Purdue Univ., Lafayette, IN (XII) — F. J. Kruidenier
P. P. Weinstein, Aspects of Growth and Differentiation of Parasitic Helminths *in vitro* and *in vivo*. **ST**=D. T. Clark

1961 Ohio State Univ., Colombus, OH (XIII) — N. D. Levine
B. Schwartz, Parasitology Old and New **ST**=D. T. Clark

SUMMARY OF AMCOP MEETINGS 1949-PRESENT

1962 Univ. of Nebraska, Lincoln, NE (XIX) — G. W. Kelley, Jr.
O. W. Olsen, The Life History of the Hookworm of Fur Seals. **ST**=D. T. Clark

1963 Univ. of Minnesota, St. Paul, MN (XV) — M. F. Hansen
F. G. Wallace, Observations on the Louisiana State University Inter-american Program in Tropical Medicine **ST**=D. T. Clark

1964 University of Chicago, Chicago, IL (XVI) — D. T. Clark
R. E. Kuntz, Paragonimiasis in Formosa **ST**=E. J. Hugghins

1965 Kellog Biol. Station, Gull Lake, MI (XVII) — P. E. Thompson
L. Jacobs, Toxoplasmosis **ST**=E. J. Hugghins

1966 Univ. of Illinois, Urbana, IL (XVIII) — M. J. Ulmer
D. L. De Guisti, The Acanthocephala **ST**=E. J. Hugghins

1967 Iowa State Univ., Ames, IA (XVIV) — P. J. Silverman
N. D. Levine, Parasitology, Problems and Promise **ST**=E. J. Hugghins **H**=P. M. Nollen [FIRST HERRICK AWARD]

1968 Univ. of Wisconsin, Madison, WI (XX) — E. G. Wallace
D. R. Lincicome, The Goodness of Parasitism. (with APS & AIBS) **ST**=J. H. Greve **H**=W. G. Barnes

1969 Univ. of Cincinnati, Cincinnati, OH (XXI) — H. W. Manter
H. W. Stunkard, Life Histories and Systematics of Parasitic Flatworms **ST**=J. H. Greve **H**=B. Caverny **H**=T. P. Bonner

1970 Loyola, Univ., Chicago, IL (XXII) — J. L. Crites
M. J. Ulmer, Helminths from Midwest to Mediterranean **ST**=J. H. Greve **H**=J. Blankenspoor

1971 Univ. of Louisville, Louisville, KN (XXIII) — E. Etges
M. Van der Schalie, Dam Large Rivers - Then What? **ST**=J. H. Greve **H**=R. Campbell

1972 Southern Illinois Univ., Carbondale, IL (XXIV) — B. J. Jaskowski
R. M. Cable, The Lighter Side of Parasitology. **PO**=T. T. Dunagan **ST**=J. H. Greve **H**=E. M. Cornford

1973 Notre Dame Univ., IN (XXV) — R. Shumard
R. F. Riek (Merck), Babesiosis and the Development of *Babesia* in Ticks **PO**=R. Thorson **ST**=J. H. Greve **H**=? Danley

1974 Univ. of Michigan, Ann Arbor, MI (XXVI) — D. Ameel
M. J. Ulmer, Snails, Swamps, and Swimmer's Itch. **ST**=J. H. Greve **H**=P. T. LaVerde **H**=D. Prechel

1975 Iowa State Univ., Ames, IA (XXVII) W. Bemrick
P. M. Nollen, Studies on the Reproductive Systems of Parasitic Flatworms or All You Wanted to Know About Sex in Worms and Were Afraid to Ask. ST=J. H. Greve H=I. Wittrock L=V. M. Nelson [FIRST LARUE AWARD]

1976 Univ. of Nebraska, Lincoln, NE (XXVIII) J. Greve
A. C. Todd, A Redefinition of Subclinical Parasitism and Its Impact on World Politics. ST=W. H. Coil PO=M. H. Pritchard H=W. L. Current L=C. A. Klu

1977 Kansas State Univ., Manhatan, KA (XXIX)= T. T. Dunagan
A. J. Mac Innis, Snails, Dollars, DNA and Worms. PO=W. D. Lindquist ST=W. H. Coil H=M. Fletcher L=L. Smurro L=J. Ketchum

1978 Indiana Central Univ., Indianapolis, IN (XXX) E. J. Hugghins
J. P. Dubey, Recent Advances in Feline and Canine Coccidia and Related Organisms. PO=Milo Brandt ST=W. H. Coil H=D. McNair L=G. Hendrickson

1979 Loyola Univ., Chicago, IL (XXXI) D. E. Gilbertson
E. Foor, Basic Studies in Reproduction (in Nematodes). PO=B. J. Jaskowski ST=W. H. Coil H=G. Plorin H=D. Minchella L=M. Fletcher

1980 Eastern Michigan Univ., Ypsilanti, MI (XXXII) A. D. Johnson
J. R. Williams, Tropical Parasitology at the Junction of the White and Blue Nile Rivers PO=E. Waffle ST=G. Garoian H=C. L. Williams L=M. Goldman L=R. Gamble S=Functional Morphology of Acanthocephala

1981 Eastern Illinois Univ., Charleston, IL (XXXIII) D. M. Miller
G. D. Cain, Antigenic Variation: New Techniques Applied to Old Problems PO=B. T. Ridgeway ST=G. Garoian H=J. M. Holly L=B. N. Tuggle S=Immunity to Protozoan Parasites

1982 Western Illinois Univ., Macomb, IL (XXXIV) D. G. Myer
J. D. Briggs, Biological Control of Invertebrates in International Programs PO=P. M. Nollen ST=G. Garoian H=D. E. Snyder L=C. L. Williams S=Biological Control of Organisms

1983 Univ. of Illinois, Urbana, IL (XXXV) C. M. Vaughn
H. M. Moon, Speculations on the Pathogenesis of Cryptosporidiosis with Comparisons to Other Enteric Infections PO=K. S. Todd, Jr. ST=G. Garoian H=K. J. Hamann L=K. W. Bafundo S=Intestinal Protozoa

1984 Univ. of Iowa, Iowa City, IA (XXXVI) W. H. Coil
J. Donelson, Genetic Rearrangement and the Basis of Antigenic Variation in African Trypanosomes. PO=G. D. Cain ST=G.Garoian H=K. F. Forton L=D. Woodmansee S=Helminth Immunology

1985 Ohio State Univ., Colombus, OH (XXXVII) B. T. Ridgeway
K. D. Murrell, Epidemiology of Swine Trichinosis: Could Both Zenker and Leuckart be Right? PO=P. W. Pappas ST=G. Garoian H=R. L. Lavy L=K. F. Forton S=Physiological Ecology of Parasites

1986 Univ. of Missouri, Columbia, MO (XXXVIII) G. T. Cain
R.C. Tinsley, Correlation of Host Biology in Polystomatid Monogenea. H=M. C. Lewis H=I. G. Welsford L=Leiby PO=L. Uhazy, ST=D. Miller, S=Gene Expression in Helminth Development

1987 Southern Illinois Univ., Edwardsville, IL (XXXIX) P. M. Nollen
Kevin Kazacos, Baylisascaris nematodes — Their biology and role in larva migrans disease. PO=D. Myer ST=D. Miller S=Modern Systematics in Parasitology, H=D. A. Leiby L=V. A. Connors

1988 Purdue University, West Lafayette IN (XL) G. Garoian
W. H. Coil, Forty years of AMCOP, Laying a foundation. PO=K. Kazacos & D. Minchella ST= D. Miller S=Host Parasite Genetics H=? L=?.

FUTURE MEETINGS

1989 Miami University, Oxford, Ohio (XLI)

1990 Vermillion, S. D. (XLII)

1991 ?

AMCOP
40th Annual Meeting
at
Purdue University, West Lafayette, IN
June 3-4, 1988

Registration

Participants are urged to preregister for the annual meeting by completing the registration form provided and returning it immediately with payment as indicated on the form. The deadline for receipt of preregistration by mail is Friday, May 27, 1988. All materials for preregistrants can be picked up at the Registration Table on the ground floor (G-400 corridor) of Lilly Hall on Friday. On site registration will also be conducted.

Accomodations and Parking

Use the enclosed form to make housing arrangements at the Young Graduate House. Linen service, towels, etc., are all provided. The graduate house is air-conditioned and there are group bathroom facilities and lounges on each floor. From the graduate house it is a 5 minute walk west on State Street to Lilly Hall. When you check in you will receive a parking pass and be directed to nearby parking lots.

For those conferees who desire other accomodations, the West Lafayette area has several motels within a 10 minute drive to the Purdue Campus. These would include:

Family Inns of America
1920 Northwestern Ave. (317) 463-9511

Sheraton University Inn
3001 Northwestern Ave. (317) 463-5511

West Lafayette Travelodge
North River Road at
State Street (317) 743-9661

Travel

West Lafayette and the Purdue University campus are accessible from Interstate 65, U.S. Highway 52, and Indiana Highways 25, 26, 38, 43, and 231. Traveling on I-65, West Lafayette is 60 miles northwest of Indianapolis, and 120 miles southeast of Chicago.

Food

Food service is available on the campus at the Purdue Memorial Union and at Hawkins Graduate House Cafeteria, both of which are adjacent to Young Graduate House. A number of fast-food restaurants are available in the West Lafayette village, within a 5 minute walk east on State Street from the graduate house.

Reception: Thursday, June 2, 7:00 - 11:00 p.m., Minchella home, 177 Drury Lane, W. Lafayette. See enclosed map.

Banquet: Friday, June 3, 7:00 p.m., Morris Bryant Smorgasbord. The annual banquet will be a smorgasbord dinner following a cash bar Social Hour from 6:00 to 7:00 p.m. Tickets for the banquet, $13.00 each, must be purchased in advance by pre-registration. The menu for the dinner is enclosed. As you can see, Morris Bryant has a good variety and "something for everyone" (and all you can eat). See enclosed map.

Abstracts

Abstracts are due to Dr. Donald Miller at SIU at Carbondale by May 5. See previous mailing for abstract form.

Symposium

The AMCOP Symposium will be held Friday, June 3 from 1:00 - 3:00 p.m. This years theme is Host-Parasite Genetics. Terry A. Dick, Department of Zoology, University of Manitoba and Joan K. Lunney, Animal Parasitology Institute, U.S.D.A. will be our speakers.

We look forward to seeing you all in West Lafayette. If you have any questions or we can be of assistance, please call.

Kevin R. Kazacos (317) 494-7556; -6591
Dennis J. Minchella (317) 494-8188
Co-chairs, AMCOP-40

8188-TR

REGISTRATION FORM

ANNUAL MIDWESTERN CONFERENCE OF PARASITOLOGISTS

PURDUE UNIVERSITY (AMCOP XL)

JUNE 3-4, 1988

This registration form must be received no later than May 27, 1988.

NAME: _____

ADDRESS: _____

_____

Business Phone ( )_____ Home Phone ( )_____

Banquet ticket(s) for June 3, 1988:

No. _____ at $13.00 each . . . . . .$_____

Registration fee:

Student Member ($4.00) . . . . . .$_____

Professional Member ($10.00) . . . . . .$_____

Membership Fee ($3.00, if you haven't paid). . . . .$_____

TOTAL AMOUNT ENCLOSED $_____

****

COMPLETE ONE FORM FOR EACH INDIVIDUAL ATTENDING AMCOP XL

Make checks or money orders payable to Purdue University
Return the completed form and fees to:

Continuing Education Business Office
Room 110, Stewart Center
Purdue University
West Lafayette, IN 47907

YOUNG GRADUATE HOUSE RESERVATIONS

DATE OF THIS REQUEST_____

ROOM RESERVATION FOR 40th ANNUAL MIDWESTERN CONFERENCE OF PARASITOLOGISTS
JUNE 3-4, 1988

NAME(S)_____

STREET_____

CITY, STATE
& ZIP
CODE_____

AREA CODE
& PHONE
NUMBER_____

ARRIVAL
DATE_____ DEPARTURE
DATE_____

Number

( ) Persons, single room @*$23.37/day
( ) Persons, double @*$18.37/day

_____ ( ) Assign a roommate
Roommate's name ( ) Non-smoker ( ) Smoker

Bills are payable upon check-in. Credit cards cannot be honored.
Personal checks, payable to Purdue University, are acceptable.

Please return this reservation application to:

Young Graduate House
Box 100
West Lafayette, IN 47907

If you have any questions, please feel free to contact (317)494-7045.

Morris Bryant

SMORGASBORD

1800 U.S. 52 West West Lafayette, Indiana (317) 463-2531

AMCOP BANQUET
Friday June 3, 1988
Cash Bar 6:00-7:00 p.m., Dinner 7:00

ENTREES

Steamship Round of Beef
Beef Tips
Ham/Cherry Sauce
Marinated Mushrooms
Fried Chicken
BBQ Ribs
French Fried Shrimp
Seafood Newberg and Rice
Baked Whitefish
Baked Potato
Sweet Potato
2 Vegetables
Rolls and Butter

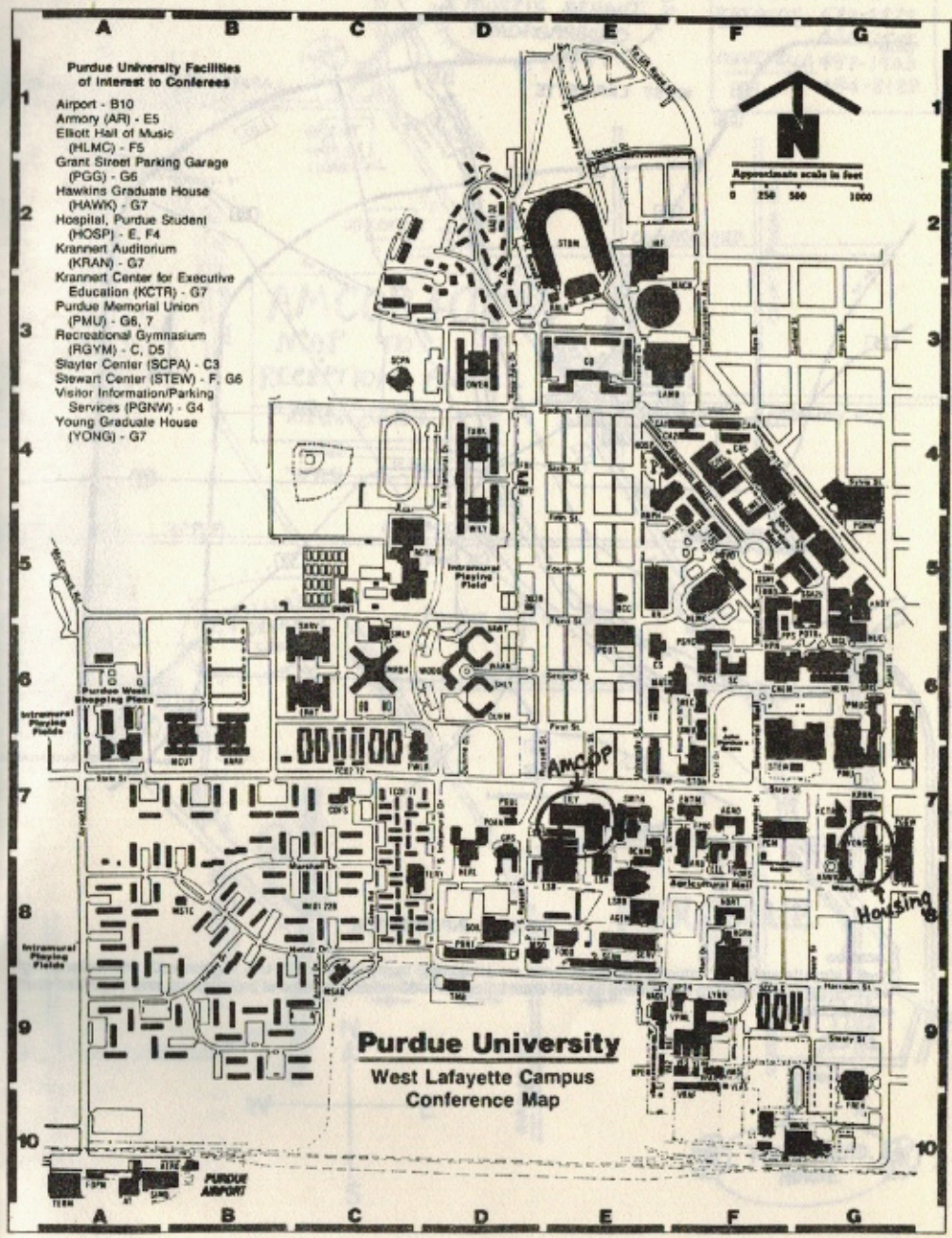
DESSERT BAR

Strawberry Shortcake
Vanilla Ice Cream
Hot Fudge
Chopped Nuts
Chocolate Cake
Angel Food Cake
Ginger Peach Cake
Mixed Fruit
Whipped Topping

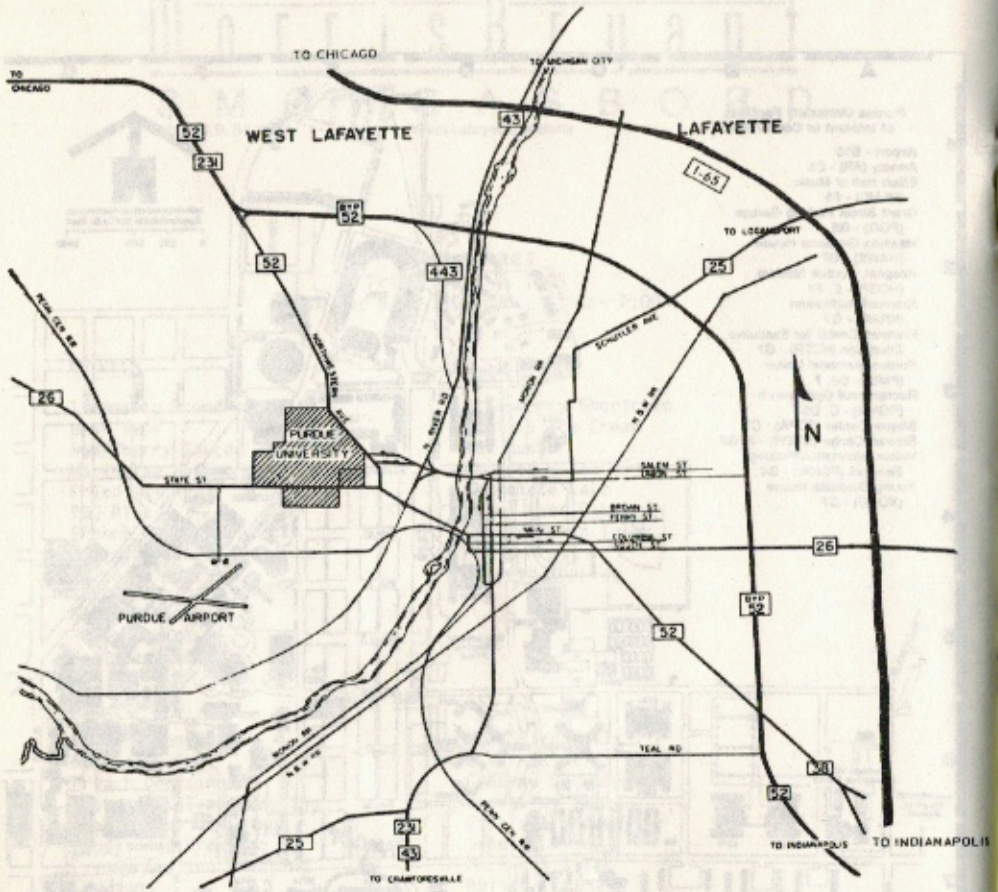
SALAD BAR

Combination Salad
Spinach Salad
French Dressing
Thousand Island Dressing
Bleu Cheese Dressing
Poppy Seed Dressing
Creamy Italian Dressing
Croutons
Bacon Bits
Grated Cheese
Pickled Beets
Potato Salad
Wispride Cheese/crackers
Jello Molds
Cole Slaw
Herring in Wine
Herring in Cream

Ham Salad Balls
Liver Balls
Creamed Cucumbers
Cranberry Salad
Pickle & Olive Tray
Swedish Rice
Macaroni Salad
Relish Tray
Cottage Cheese
Apple Sauce
Whipped Jello Squares
Three Bean Salad
Pea Salad
Creme Cheese w/strawberry sauce
Shrimp in the shell
Cocktail Sauce
Lemon Wedges



WELCOME TO PURDUE



GENERAL INFORMATION

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