
society for invertebrate pathology

Volume VI, Number 4
November 1974

IOBC/SROP SYMPOSIUM

METHODS FOR THE DIAGNOSIS OF INSECT DISEASES IN
RELATION TO THEIR UTILIZATION FOR MICROBIAL CONTROL
March 21-22, 1974, Saint-Christol
France

Under the auspices of the IOBC/SROP Commission of Insect Pathology and Microbial Control, an international Symposium, "Methods for the Diagnosis of Insect Diseases in Relation to their Utilization for Microbial Control" was held. The Symposium, organized by Drs. Croizier, Meynadier, and Vey and chaired by Professor Vago, took place at the Station de Recherches Cytopathologiques (INRA/CNRS), Saint-Christol, France, March 21-22, 1974. Approximately fifty specialists from Belgium, Federal Republic of Germany, France, Greece, Iran, The Netherlands, Portugal, Spain, Sweden, Switzerland, and the United Kingdom attended.

The following presentations were made:

- A. Huger, *Darmstadt, Federal Republic of Germany*
"Cytological and Histological Methods for the Diagnosis of Insect Diseases in Relation to Microbial Control"
- J. M. Quiot, *Saint-Christol, France*
"Contribution of Invertebrate Tissue Culture to the Diagnosis of Insect Diseases"
- G. Croizier, *Saint-Christol, France*
"Immunological Diagnosis in Relation to the Microbiological Control of Insect Pests"
- P. Lüthy, *Zurich, Switzerland*
"Microbial Methods for the Diagnosis of Insect Diseases in Relation to the Development of Microbial Insecticides"
- W. A. L. David, *Littlehampton, United Kingdom*
"The Problems Involved in Sampling Insect Populations for Diagnostic Purposes"
- P. Ferron, *La Miniere, France*
"Practical Aspects of the Problems of Sampling Insects in the Field for Diagnostic Purposes"

Pathologists and specialists in microbial control discussed insect pathology, diagnostic techniques and the consequences of the use of pathogens in nature in light of recent progress in these fields. The need for further work on serology and invertebrate tissue culture was particularly emphasized.

The following recommendations were adopted:

Pathologists should develop method sheets describing simple techniques which could be employed by ecologists for diagnosing important diseases.

Entomologists should investigate ways of collecting and packing insects to ensure that specimens transported for diagnosis arrive at their destination in good condition.

A technical notice should be prepared covering proper methods for handling and dispatching specimens, specifying what information should be provided.

Serological techniques should be developed for identification of pathogens intended for practical application.

Tissue culture of insects should be used to study pathogens which are difficult to detect, culture, or identify using the usual procedures.

National and international cooperation between pathologists and ecologists should be intensified in order to plan and implement research and application projects.

The symposium illustrated a keen interest in the diagnosis of diseases of pests and identification of those pathogens responsible. However, it should be recognized that these topics represent only a part of an expanding field. There is a need, for example, to extend discussion to diseases of vector insects and numerous useful terrestrial and aquatic invertebrates. It would be advisable to arrange meetings, similar to the one held at Saint-Christol, for this purpose.

Dr. A. Vey
Station de Recherches Cytopathologiques
Institut National de la Recherche
Agronomique
30380 Saint-Christol-les-Ales (Gard)
FRANCE

EDITOR'S NOTE

Proceedings of the IOBC/SROP Symposium will not be published as a unit, but information on the publication of various papers given at the Symposium can be obtained from Dr. Vey.

NEW BOOKS ON ENTOMOPATHOGENIC BACTERIA AND FUNGI

"Entomopathogenous bacteria and their significance," by E. K. Afrikian, 1973, 418 pages, published by the Academy of Sciences of the Armenian Republic (USSR), Institute of Microbiology, Erivan. This volume, with 1000 copies published, is divided into 5 chapters: (1) historic and present state of knowledge and utilization of entomogenous bacteria (24 pages); (2) nature of entomopathogenic action of sporulated bacteria (95 pp.); (3) classification of sporulated bacteria (120 pp.); (4) bacterial insecticide preparations (70 pp.); and (5) silkworm bacteriosis and utilization of antibiotics in sericulture (59 pp.). More than 1000 bibliographic references, with 376 in Russian, complete this review.

"Entomogenous fungi; classification, biology, practical significance," by A. A. Eviakhova, 1974, 260 pages, published by the Academy of Sciences of the Soviet Union, Leningrad, with 1725 copies published. This volume deals principally with the identification of entomogenous fungi (127 pages), Phycomyces, Ascomycetes, and Deuteromycetes, and is illustrated by many drawings which complete the systematic keys. The first chapter has 60 pages dealing with the taxonomy and geographical distribution of entomogenous fungi, with the biology of the different genera, with the pathogenic phenomena that they cause to the insect, with their practical importance and with their multiplication in the laboratory. 818 bibliographic references with 193 in Russian are given.

*P. Ferron, Station de Recherches
de Lutte Biologique et de Biocoenotique
La Miniere, 78, Versailles, FRANCE*

BIBLIOGRAPHY--PHYCOVIRUSES

A current bibliography of world-wide publications on phycoviruses has been compiled and is available from:

*Dr. Robert Safferman
EPA, National Environmental
Research Center
Cincinnati, Ohio 45268 USA*

TRUMBULL APPOINTED EXECUTIVE DIRECTOR OF AIBS

On 1 October 1974 Richard Trumbull became the third executive director of the American Institute of Biological Sciences, filling the slot left vacant by the death of John R. Olive on 30 March.

Trumbull is best known as past director of research at the Office of Naval Research (ONR) and most recently as deputy executive director of the American Association for the Advancement of Science. Prior to his 17 years at ONR, he taught at Green Mountain Junior College, at Syracuse University where he received his Ph.D., and was a lecturer at the University of Maryland and at Tulane University.

A physiological psychologist, Trumbull has published 40 research reports, 13 addresses, and coauthored two books--Sensory Deprivation, published by Harvard University Press, and Psychological Stress, published by Appleton, Century, and Croft. He was also director and editor of the NATO exercise and publication, Environment Modification for Human Performance.

AIBS News, Release, 10/1/74

SIP NEWSLETTER REPORT, 1973-74

Six issues of the SIP NEWSLETTER were printed during the period of January 1973 through June 1974, at an average cost of \$120 for 750 copies of each issue. Due to the length of time required for the NEWSLETTER to reach members outside the U.S. and Canada, packages of NEWSLETTERS were forwarded by air to the following individuals and distributed from these points:

Dr. R. E. Teakle, Australia
Dr. S. V. Amonkar, India
Dr. K. Aizawa, Japan
Dr. L. P. S. van der Geest, Western Europe

As a result of the assistance of these Society members, the length of time for receipt of the NEWSLETTER by individual members in those areas has been reduced from 6 weeks to 2 weeks, with an increase in postage cost of approximately \$62 per issue.

In summary, the cost per issue (including postage and envelopes) for Vol. V, Nos. 1-3 was approximately \$135 and for Vol. V, No. 4 and Vol. VI, Nos. 1-2 (which were forwarded by air to the four distribution points) was approximately \$247. Total cost of the six issues of the NEWSLETTER was approximately \$1,296, averaging 35¢ per member for each issue.

*Beatrice A. Weaver, Editor
SIP NEWSLETTER*

PUBLICATIONS BOARD REPORT, 1973-74

A total of 204 manuscripts has been received and processed during the period June 1, 1973-May 31, 1974 in the Journal of Invertebrate Pathology which is owned and published by Academic Press under the auspices of the Society for Invertebrate Pathology. This represents an increase of 20 manuscripts over the same period of 1972-73. Of those received, 27 were rejected by both reviewers and hence returned to the authors.

*Thomas C. Cheng, Chairman
Publications Board*



SIP SEAL

Suggestions are requested for the design of an official Society seal. Among other uses, such a seal would appear on the certificates to be provided to honorary members, as well as on the masthead of the SIP NEWSLETTER and on the letterhead of the Society stationery. Please forward ideas for such a design to:

*Dr. John C. Harshbarger, Director
Registry of Tumors in Lower Animals
National Museum of Natural History
Smithsonian Institution
Washington, D.C. 20560 USA*

THIRD INTERNATIONAL CONGRESS OF PARASITOLOGY (ICOPA III)

MUNICH, AUGUST 25-31, 1974

The Third International Congress of Parasitology (ICOPA III) took place in Munich, Federal Republic of Germany, from 25-31 August 1974. There were more than 1800 registered participants. Papers were allocated to seven broad categories: (A) Protozoa; (B) Helminths; (C) Arthropods; (D) Immunology; (E) Chemotherapy; (F) Physiology and Biochemistry; and (G) Other Topics. Eighty-five Sections were designated, presentations being limited to 10-15 minutes in the case of invited papers, and 5 minutes in the case of submitted papers. Necessarily, several sectional programmes proceeded simultaneously throughout the Congress, posing familiar mechanical problems in oscillating between Sections to hear particular contributions.

Ninety-five papers more or less directly concerned invertebrate pathology and microbial control. Twenty-one were in Section G7 (Invertebrate Pathology). Appendix 1 lists their authors (an asterisk denotes SIP membership as of the July 1973 Directory) and titles as given in the ICOPA III Programme. Seventy-four papers of equal relevance to these topics were submitted under six of the broad categories given above--(A), (B), (C), (D), (F), (G)--(Appendix 2).

Thanks to the recent affiliation of SIP with the World Federation of Parasitologists (WFP), a Section (G7) was devoted to the theme of "Invertebrate Pathology" for the first time at an International Congress of Parasitology.

Section G6 (Biological Control of Noxious Animals and Plants) failed to materialize and the two papers listed under it (see Appendix 2) were read elsewhere. As is evident from Appendices 1 & 2, the pathology of non-arthropod hosts today receives more attention than many realize. Thus, approximately 50% of the contributions in G7 (13 or 62% of the 21 papers had one or more SIP members as authors) concerned non-arthropod hosts; as did approximately 50% of those read elsewhere (only 14 or 19% of the 74 papers included SIP members in the authorship). These data appear to indicate the basis for what could prove a mutually profitable membership drive.

Abstracts of the papers listed in Appendixes 1 & 2 are in the Proceedings of ICOPA III, the three volumes of which were given to participants on registration. To obtain copies of these abstracts, interested SIP members might write directly to the authors whose addresses are in the ICOPA III List of Participants. SIP members who have a copy of this list include Drs. Marion Brooks and Franklin G. Wallace (North America), Drs. E. U. Canning, P. C. C. Granham, and M. W. Service (Great Britain), Dr. J.-F. Manier (France), and Dr. Jaroslav Weiser (Eastern Europe). Members unable to track down abstracts through these sources may write directly to me for abstracts (I should ask members to be sparing in their requests since the Xeroxing task must obviously be kept within reasonable limits.).

* * * *

At the closing plenary session on Saturday, 31 August, the new officers of WFP were announced. They include:

President: Dr. G. Piekarski (Federal Republic of Germany)

Vice Presidents: Dr. B. Czaplinski (Poland)
Dr. I. G. Kagan (USA)
Dr. S. M. Touré (Senegal)

SIP will be well-represented by the election of Jaroslav Weiser as one of the WFP Board's Members-at-Large.

ICOPA III adopted two resolutions which urged governments of all nations to better support parasitological investigations because of the importance of parasites to human and environmental health and to provide more effective control of the dispersal of parasites as a result of transmitting a wide variety of animals from one region to another. A third resolution regretted that several ICOPA III contributions included descriptions of new taxa, a procedure in conflict with the International Code of Zoological Nomenclature.

In addition the Council of WFP recommended that in view of increasing costs and other factors, future international Congresses of Parasitology should not print abstracts of papers.

Dr. Marshall Laird, Director
Research Unit on Vector Pathology
Memorial University of Newfoundland
St. John's, Newfoundland
CANADA A1C 5S7

Approximately 2000 persons attended ICOPA III, representing nations throughout the world and 54 national and international parasitological societies. Of the 1081 papers submitted for the program, 530 pertained to helminthology.

Presiding at the plenary session, Dr. G. Piekarski, President of the Congress, stressed the use of juvenile hormone, larval-feeding fish, parasitic fungi, sterile release programs, lethal genes, and other forms of biological control as desirable alternatives to chemical control of pest insects.

In a symposium on Pathogens of Parasites convened by Professor C. Vago, intracellular prokaryote-like or virus-like inclusions were reported in worms and in protozoa (e.g., gregarines, plasmodia, leishmania, and amoebae). Regardless of the difficulties and cautions which must be observed in identifying the inclusions, the entire concept of a pathology of parasites was novel and was enthusiastically received by the listeners.

In the session on Invertebrate Pathology there were reports on the metabolism and fine structure of parasitized insects and snails and on the activation of immunological reactions in insects.

The cytology of the Sporozoa and the taxonomy of the Microsporidia were highly instructive. Other sessions of special interest to insect pathologists considered leishmaniasis, the American and African trypanosomiases and their relationships to insect vectors. In addition, there were lengthy "review" lectures scheduled early each morning prior to the scheduled sessions.

The Fourth International Congress of Parasitology will be held in Warsaw, Poland.

Marion A. Brooks
Department of Entomology,
Fisheries, and Wildlife
St. Paul, Minnesota 55101

Continued on page 4

APPENDIX 1

ICOPA III, Section G7 - INVERTEBRATE PATHOLOGY. 26 and 28 August 1974

- 1 GIEBEL, P.E. & A.J. DOMNAS Carbohydrate metabolism in larvae of *Culex pipiens quinquefasciatus* infected with *Lagenidium giganteum*
- 2 RÜSSLER, R., *W. WÜLKER & P. GRINZINGER Changes of carbohydrates in the hemolymph of mermithized *Chironomus* larvae (Insecta, Diptera)
- 3 *BROOKS, M.A. Growth deficiencies satisfied with polypeptides
- 4 *WÜLKER, W. & G. KÜMMEL Investigations on the ultrastructure of corpora allata in mermithized *Chironomus* (Insecta, Diptera)
- 5 YOSHINO, T. Some fine structural observations on the histopathologic effects of larval Digenea on gastropod digestive gland acinar cells
- 6 *GORDON, R., *C.H. BAILEY and J.M. BARBER Developmental changes of the mermithid nematode *Reimermis nielsenii* in a larval mosquito host
- 7 DENNIS, E.A. & R. DOUGLASS The histopathology of the trematode infection, *Proctoeces maculatus*, in the mussel, *Mytilus edulis*
- 8 *CHENG, T.C. Electron microscope studies on reactions in molluscs to helminths
- 9 *HOSKIN, C.P., *T.C. CHENG & A. GRYNKEWICH An electron microscopical study of the redia-mollusc interface of *Himasthla quissetensis* and *Nassarius obsoletus*
- 10 RODRICK, G.E. The enzymatic basis of molluscan cellular reactions
- 11 *PYE, A.E. Prophenoloxidase activation by microbial materials
- 12 *CODREANU, R. On two Microsporidia inducing giant cells in a crustacean (Anostraca) and insect (Ephemeroptera) host
- 13 *JAFRI, R.H. & M. ASHRAF Pathogenicity of protozoan parasites (Microsporidia) to silk gland cells of *Galleria mellonella* larvae exposed to ultraviolet radiation
- 14 *WHISLER, H.C. Biology of *Coelomomyces psorophorae* in *Culiseta inornata*
- 15 VIRAT, M. & T. GEVREY Action of some predacious fungi on the third-stage trichostrongylid larvae
- 16 FOURNIER, A., *C. VAGO & M. COMBES An intracellular pathogenic prokaryote in *Euzetrea knoeffleri* (Monogenea) parasite of *Exproctus montanus*
- 17 BEKKOUICHE, Z. & J. DUPOUY Observation of intracellular bacteria in somatic cells and in oocytes of *Polystoma intergerrinum* (Monogenea) parasite of *Rana temporaria*
- 18 DAVIES, E.E. & R.E. HOWELLS Microbial infections associated with plasmodial development in *Anopheles stephensi*
- 19 VIVARES, C.P. Occurrence of paracrystalline masses of intranuclear particles in a parasitic gregarine (Protozoa, Sporozoa)
- 20 MATTERN, C.F.T. & L.S. DIAMOND Viruses of *Entamoeba*
- 21 *DEVAUCHELLE, G. & D. VINCKIER Occurrence of micro-organisms in parasitic gregarines
- A2 CYTOLOGY OF PARASITIC PROTOZOA OTHER THAN SPOROZOA
- CHANG, K.P., J.C. CHANG, R.S.TUAN & S. SASSA Ultrastructure and heme biosynthesis of symbiotic bacteria in two species of hemoflagellates
- GRAIN, J. & P. DE PUYTORAC Particularités ultrastructurales des cinétosomes et de leurs dérivés fibrillaires chez des ciliés astomes Hoplitophryidae, parasites du tube digestif d'oligochètes
- SPEER, C.A. & *N.N. YOUSSEF Cinematographic observations on *Carchesium polyinum*: A commensal protozoan on the tadpole shrimp
- A3 CYTOLOGY OF SPOROZOA
- SHREVEL, J. Cytologie des grégaires
- *CANNING, E.U. & R.E. SINDEN The fine structure of *Favincystis tribolii* (Schizogregarinida) in *Palaemon ocellaris*
- BALESCU-CODREANU, D. Cytological and ultrastructural features of the gregarine *Cephalodiphora synurellae* BALESCU (1972) parasitic in the freshwater amphipod *Synurella ambulans*
- A4 BIOLOGY OF PARASITIC FLAGELLATES
- ROBERTS, J.F., N. MORALES & K.E. MUSE Mitochondrial RNA synthesis in *Crithidia fasciculata*
- A5 BIOLOGY OF HAEMOSPORINA
- MAIER, W. Some effects of malaria parasites on the mosquito host
- A6 LIFE CYCLES OF COCCIDIA, SARCOCYSTIDAE AND TOXOPLASMIDAE
- MARKUS, M.B. Birds, coprophagous arthropods and coccidian oocysts
- A10 BIOLOGY OF CNIDOSPORIDA
- GÖTZ, P. Homology of the manubrium of *Mraesikia brevicauda* (Microsporida) and the polar filament of *Nosematidae* (Microsporida)
- JACOBS, F.J. *Nosema apis* Zander und *Aminosphären* im Mitteldarm der Honigbiene (*Apis mellifica* L.)
- *WEISER, J. Microsporidiosis in invertebrates and vertebrates - a comparison
- BOUÏX, G., C. LOUBES & J. MAURAND La sporogonie des microsporidies - remarques cytochimiques sur quelques espèces
- B1 ECOLOGY OF FREE-LIVING STAGES OF PARASITIC NEMATODES
- ABOUL NASR, A.E. Nematode (Family Mermithidae) infections in *Anopheles gambiae* and *A. funestus* in Nigeria
- B2 BIOLOGY AND EVOLUTION OF MONOGENEANS AND TREMATODES
- LLEWELLYN, J. The biology of isancistrine monogenean parasites of the cephalopod *Alloteuthis subulata*
- JAMES, H.A. Sex and foot colour in the periwinkle snail, *Littorina littorea* (L.), infected with larval stages of the heterophyid trematode, *Cryptocotyle lingua* (Creplin)
- POJMANSKA, T. The biological and morphological adaptations towards the environment within Leucochloridiidae
- FAHMY, M.A.M. Attempts to infect *Bulinus truncatus* naturally infected with the larval stages of *Echinoparyphium recurvatum* with *Schistosoma haematobium*
- OW-YANG, C.K., J.LIE KIAN & *L. HOK-KAN Interspecific competition between larval trematodes in the snail host
- HUEHNER, M. & F.J. ETGES Development of *Aspidogaster conchicola* in a snail host, *Viviparus malleatus*
- CABLE, R.M. Ancyloid snails as "surrogate" molluscan hosts of digeneans
- VAES, F. A new type of trematode life cycle: an invertebrate as final host
- SHIFF, C.J. Some factors influencing host location by miracidia of *Schistosoma haematobium* under natural conditions
- LIE, K.J. & D. HEYNEMAN Inability to reinfect snails harboring *Echinostoma lindoense* with the same trematode species

APPENDIX 2

(This list of ICOPA III contributions relevant to INVERTEBRATE PATHOLOGY but allocated to other subject-areas and Sections of the Congress, is given in Sectional order)

A1 TAXONOMY AND MORPHOLOGY OF PARASITIC PROTOZOA

KRISHNAMURTHY, R. Notes on some rare morphological features in the flagellates of the genus *Monocercomonoides* TRAVIS, 1932 from arthropods

DAS, A.K. On the taxonomic status of some controversial genera and species of flagellates from Indian termites

HALDAR, D.P. & N. CHAKRABORTY A new cephaline gregarine, *Phleobium gigantinum* n.gen., n.sp. (Protozoa: Sporozoa) from a grasshopper

WEISER, J. Morphological basis of the taxonomy of Microspora

*CODREANU, R. & D. BALESCU-CODREANU On the morphology and ultrastructure of the microsporidian *Thelohantia octospora* HENNEGUY, 1892, parasitic in the prawn *Palaemon serratus* (PENNANT) 1777 from the Atlantic French coast; need for a revision of its taxonomic status

*VAVRA, J. Fine structure as a criterion in the taxonomy of Microsporidia

DE PUYTORAC, P. & J. GRAIN Etude de la tomitogenèse et de l'ultrastructure du tomite d'un cilié apostome: *Collinia orchestiae*, endoparasite sanguicole de crustacés

- B3 BIOLOGY AND EVOLUTION OF CESTODES AND ACANTHOCEPHALA
CZAPLINSKI, R. & D. SZELENBAUM The ability of larvae of some Hymenolepididae to survive the winter within Ostracoda under natural conditions
- B4 FINE STRUCTURE OF MONOGENEANS, TREMATODES AND CESTODES
KRUPA, P.L. & B.J. BOGITSH Ultrastructural localization of enzymes with Diaminobenzidine in schistosome larvae and the snail host
- B5 FINE STRUCTURE OF NEMATODES
*POINAR, G.O. Jr. On the anatomy and fine structure of pre-parasitic juvenile Mermithidae (Nematodes)
MADEL, G. & E. SCHOLTYSECK Fine structural study of *Sphaerularia bombi* (Tylenchida, Nematoda)
DICK, T.A. Ultrastructure of the esophagus and intestine of the oxyurid, *Blatticola blattae* (GRAEFFE, 1860)
- B6 CULTIVATION OF HELMINTHS
MYERS, R.F. Cultivation attempts on the mermithid, *Necomesomeris fluminalis*
KURSHVILI, B. & G. KAKULIA Cultivation of *Neoapectana georgica* KAKULIA and VEREMTSUK, 1968
TARAKANOV, V.I. & G.N. ANDREEVA Axenic culture of three nematode species of the *Neoapectana* genus
JACKSON, G.J. & W.L. PAYNE Culture conditions for *Rhabditis manupati* a nematode from the food snail, *Helix aspersa*
- B13 FILARIAE AND FILARIASIS
KILAMA, W.L. Variation in susceptibility of *Aedes aegypti* (L.) strains to *Wuchereria bancrofti* (COBBOLD) infection
- B16 METASTRONGYLID INFECTIONS
SAUERLÄNDER, R. The African giant snail (*Achatina fulica*) as experimental intermediate host of *Angiostrongylus vasorum*
- B21 SCHISTOSOMES AND SCHISTOSOMIASIS
WEISS, N., A. DEGREMONT, K. TANNER & A. ZUMSTEIN Susceptibility to *Schistosoma haematobium* and comparative antigenic analysis of two closely related *Bulinus* species from Madagascar
FAN, P.C., K.Y. PAO & M.C. LEE Susceptibility of *Biomphalaria glabrata* and *Oncomelania hupensis chinii* to hybrid miracidia of schistosomes
UPATHAM, E.S. Exposure of caged sentinel *Biomphalaria glabrata* to investigate contamination of *Schistosoma mansoni* miracidia in natural St. Lucian habitats
FRANDSEN, F. Host-parasite relationship between *Schistosoma haematobium* Egypt and different strains of *Bulinus truncatus*
PAGE, C.R., III, E.G. ELLGAARD & W.C.L. FENG Effects of *Schistosoma mansoni* on the mobility of *Biomphalaria glabrata*
CARTER, O.S. & F. ETGES Histological/histochemical studies of the effects of *Schistosoma mansoni* on reduced fecundity of *Biomphalaria glabrata*
- C1 CYTOGENETICS OF VECTORS OF DISEASE
EZENWA, A.O. Ecology of free-living stages of mermithid parasites of blackflies
- C2 BIOLOGICAL AND GENETIC CONTROL OF VECTORS
GHEORGHIU, T. & E. UNGUREANU Toxicity of *Bacillus thuringiensis* on mosquito larvae
- C6 BIOLOGY OF SIMULIIDAE
CARLSSON, G. Control of black fly vectors - research needs
*RUBTZOVA, I.A. Natural enemies of the black flies
MAURAND, J. Influence des microsporidies sur le développement des larves de simules
- LOUBES, C. & J.-F. MANIER Sur *Coelomycidium simulium* DEBAISIEUX, phycomycète pathogène mortel pour les larves de simules
EZENWA, A.O. Field observations on trends of mermithid and microsporidan parasitism of Simuliidae
- C7 BIOLOGY OF BITING FLIES OTHER THAN GLOSSINIDAE
ANDREYEVA, R.V. Some peculiarities of ecology and biology of *Coelomomyces milkoii*, DUDKA and KOVAL - a fungus parasitic on tabanid larvae
- C8 BIOLOGY OF GLOSSINIDAE
BAUER, B. Bacterial infections in *Glossina morsitans*, WESTWOOD fed through membranes
NOGGE, G. Investigations on the role of symbionts in tsetse-flies (*Glossina morsitans*)
- C9 BIOLOGY OF TICKS
ČERNÝ, V., M. DANIEL, F. DUBÁBEK, E. HONZÁKOVÁ, S. KALÁKOVÁ & *A. SAMŠINÁKOVÁ The entomogenous fungi associated with *Ixodes ricinus* (L.)
- C10 MITES OF MEDICAL AND VETERINARY IMPORTANCE
STOREY, D.M. & W.E. KERSHAW The effects of infection with *Litomosoides carinii* on the tropical rat mite *Liponyssus bacoti*
- D8 CELL MEDIATED IMMUNITY IN HELMINTH INFECTIONS
HEYNEMAN, D., W. PAGE FAULK, *HOK-KAN LIM, H.G. LEE Studies on cellular and noncellular host defense mechanisms in the snail *Biomphalaria glabrata*
- F1 METABOLISM OF PARASITIC PROTOZOA
TUAN, R.S. & K.P. CHANG Isolation and characterization on DNA from symbiotic and aposymbiotic strains of *Platytrichia outlots*
- G1 SNAIL CONTROL
JACKSON, G.J., W.H. ANDREWS, Jr., J.R. CORHAM, J.W. BIER, W.L. PAYNE & C.R. WILSON Survey of microflora and microfauna associated with the Moroccan food snail, *Helix aspersa*
- G5 CONTROL OF PARASITIC STAGES IN SEWAGE AND SOIL
PANDEY, V.S. The fungi that prey on the infective larvae of parasitic nematodes of animals
- G6 BIOLOGICAL CONTROL OF NOXIOUS ANIMALS AND PLANTS
HUDSON, K.E. The integrated use of nematodes and chemicals in control of glass-house sciarid flies
GRASSMICK, R.A. & W.A. ROWLEY Ciliated protozoa as possible mosquito-control agents
- G8 PARASITOLOGICAL PROBLEMS IN THE MARINE ENVIRONMENT
*CODREANU, R. & D. BALCESCU-CODREANU On the reproductive metamorphosis of *Utrioopsis pygmaea* (RATHKE) 1843, epicaridean hyperparasitic of the rhizocephalan *Peltogaster paguri* (RATHKE) 1843 from the *Pagurus bernhardus* (L.) of the French Channel Coast
JONES, I. Comparative observations on blood sporezoa of sipunculids
DOUGLASS, W.R. Differential development of *Minchinia nelsoni* (Haplosporida, Haplosporidiidae) in resistant and susceptible *Crassostrea virginica*
JOHNSON, C.A., III *Hematodinium perezii* CHATTON and POISSON 1931, a parasitic dinoflagellate of marine decapods
RYCKAERT, M., C.P. VIVARES & H.J. CECCALDI Etude électrophoretique de l'influence des microsporidioses sur la composition biochimique de l'hémolymphe et des muscles de crustacés décapodes marins
REIMER, L.W. The position of cephalopods in life cycles of helminths of marine fishes
CRUZ-REYES, A. Helminthofauna of shrimp of the genus *Penaeus fabricius*, from northwest of Mexico
KO, R.C., B. MORTON & P.S. WONG *Echinoccephalus* sp. MOLIN, 1858 (Spiruroidea: Gnathostomatidae), an unusual nematode from the oyster, *Crassostrea gigas* THUNBERG, 1793

Continued on page 5

Among the impressions left from the visit is that Munich is a remarkably clean city. Public transportation is superb via train, "S bahn" or "U bahn." Railways operate on the honor system, with tickets obtained from vending machines and cancelled by a time clock upon boarding. Conductors and ticket takers are very conspicuous by their absence. Accommodations were plentiful and a variety of rooms were available in the vicinity of the Congress Centre.

Excursion trips were successful and filled to capacity. The weather was fickle, however, and organized camera safaris were in luck only if the day happened to be bright and sunny.

Whether participants discovered spontaneous folk dancing in the Marienplatz Mall, brass bands in rathskellers, or concerts in Bavarian castles, most agreed that Munich provided an excellent setting for ICOPA III.

The meeting itself was valuable and generally well-run. Sound systems and lighting in meeting rooms were functional and speakers could be heard easily. Projectionists in general did well and slides were right side up, in order, and changed on cue. Since the allotted times were short, the skill of projectionists was a major factor in maintaining schedules and avoiding embarrassing delays. The rooms seemed to be well-chosen with respect to size and attendance. The organizers deserve praise for anticipating these needs.

Last minute and substitute chairmen are to be commended for their efforts in keeping sections organized and viable. Special thanks go to Marion Brooks who assumed leadership of G7, the invertebrate pathology section, and her able co-chairman, Dr. A. M. Huger, who were ready with suitable questions if the discussion became stalled and who were excellent moderators.

Despite the best efforts of the organizers, however, there was some confusion as a result of the drastic alteration of the original schedule. Section G7, for example, originally scheduled for Thursday, August 29, was divided and rescheduled for Monday, August 26 and Wednesday, August 28. This scheduling was particularly difficult for speakers who could not attend the entire proceedings and some arrived to discover that, according to the revised schedule, they were too late to present their paper. However, the chairmen made every effort to reorder the sequence of speakers to accommodate late arrivals.

The scientific value of these symposiums is primarily in the discussion following presentations. In general speakers were well-prepared and adhered to allotted times so that discussion could follow. Audience questions ranged from concern over methodology to frank disagreement with the speakers' conclusions.

It is hoped that when the Fourth International Congress of Parasitology is held, travel funds will be more readily available so that the greatest obstacle for a successful meeting, limited participation, can be overcome.

George P. Hoskin
Department of Biology
Lafayette College
Easton, Pennsylvania 18042
USA

EDITOR'S NOTE

The three-volume set of abstracts, including 1732 total text pages and an 18 page author index, for ICOPA III is available through Facta Publications, printed by Egermann Druckereigesellschaft m.b.h., A-1170 Vienna, Austria.

SYMPOSIUM ON "NEOPLASMS IN AQUATIC ANIMALS AS INDICATORS OF ENVIRONMENTAL CARCINOGENS"

The International Union Against Cancer's Committee on Comparative Oncology held a Symposium on "Neoplasms in Aquatic Animals as Indicators of Environmental Carcinogens" at University College, Cork, Ireland, October 15-18. Several members of the Society for Invertebrate Pathology participated in the meeting organized by Dr. Clyde J. Dawe of the U.S. National Cancer Institute.

An exciting development is the discovery, by several investigators, of tumors in molluscs such as mussels, clams, and oysters. Dr. Aaron Rosenfield (National Marine Fisheries Service Laboratory, Oxford, Maryland, USA), in reviewing this subject, pointed out that tumors are now known to occur in molluscs of nine different species in 13 different localities. Some of these tumors resemble leukemia of warm-blooded vertebrate animals. Mr. C. Austin Farley (National Marine Fisheries Service Laboratory), who was the first to discover many of these tumors, described a new cancer in a non-commercial clam. He presented evidence that these tumors arise in the gill tissues of the clam and described two viruses found in oysters, which are the first virus infections to become known in oysters. Dr. John A. Couch (Gulf Breeze Environmental Research Laboratory, Gulf Breeze, Florida, USA) reported the discovery of a virus infection of shrimp.

Dr. Michael C. Mix (Oregon State University, Corvallis, Oregon, USA) demonstrated, by means of radioisotope methods, that the tumor cells in oysters behave as tumor cells of other animals in rapidly taking up one of the building blocks of deoxyribonucleic acid necessary for cell multiplication. Mr. Peter Wolf (State Fisheries Department, New South Wales, Australia) reported that he is continuing to find numerous epidermal papillomas of the mantle, the shell-forming organ, in oysters of specific estuaries in eastern Australia.

Although evidence was presented which suggests that flounder and sole have no higher incidence of benign skin tumors in domestically polluted waters, Dr. Francis Rose (Texas Technical University) found that salamanders inhabiting a treated sewage-disposal pond have a very high prevalence of several types of skin tumors while salamanders from unpolluted nearby ponds were tumor-free. In collaboration with Dr. John C. Harshbarger (Smithsonian Institution, Washington, D.C., USA), he is attempting to identify the cause of these tumors.

The proceedings of the Symposium will be published in approximately one year in Volume 21 of Progress in Experimental Animal Research, Freddy Homburger, Editor, S. Karger.

Excerpted from a newspaper account of the Symposium.

REGISTRY OF TUMORS IN LOWER ANIMALS

A new Activities Report for the Registry of Tumors in Lower Animals (1965-1973) is now available. The Activities Report includes information on the establishment, objectives, and operation of the Registry, as well as accession indices.

Copies of the Activities Report may be obtained from:

John C. Harshbarger, Director
Registry of Tumors in Lower Animals
National Museum of Natural History
Smithsonian Institution
Washington, D.C. 20560 USA

GUIDELINES FOR DEPOSITION OF SLIDE MATERIALS IN THE INTERNATIONAL PROTOZOAN TYPE SLIDE COLLECTION

- A. Any investigator who wishes to deposit slides in the International Protozoan Type Slide Collection is requested to:
1. Send his material to Dr. Klaus Reutzler, Division of Echinoderms and Lower Invertebrates, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560, USA. It would be greatly appreciated if contributors of large numbers of slides would contact Dr. Reutzler by mail prior to shipment so adequate preparations can be made. In the case of small depositions, a short letter of information enclosed with the slides would be sufficient.
 2. Permanently mount all his material on 3" x 1" (76 mm x 25 mm) glass microscope slides identified with permanent labels. Gummed paper slide labels are perfectly acceptable, but the genus, species, and type should be etched with a stylus on the reverse side of the slide in case the label is lost. Labels should be hand printed in ink for clarity. Pertinent information would include:
 - a. genus, species, author, and year;
 - b. material type (holotype, lectotype, etc.);*
 - c. space for a seven digit accession number (width of the slide and 1/8" or 4 mm of height will suffice);
 - d. space for a seven digit catalogue number (same space as in "c"), particularly in the case of type specimens.
 3. Submit slides in some predetermined order accompanied by three copies of a listing of additional information (data sheet). Such information might include:
 - a. if parasitic, the host;
 - b. collection locality;
 - c. stain;
 - d. number of slides prepared from the original population;
 - e. identifier (if one is consulted);
 - f. higher classification;
 - g. any pertinent remarks.The Standing Committee on Type Slide Collections will try to provide a standardized form for contributors.
 4. Submit one additional data sheet to the Museum for each type specimen deposited. Due to their importance, the type specimens will form a separate subcollection and will receive special care.
 5. Include a copy of the paper originally describing any type material being deposited. If a reprint is not yet available, the paper should have been accepted for publication or be in press before deposition is made. This is necessary to guarantee the integrity and continuity of the Collection.
 6. Send only microscope slide specimens. While the great advantages of ultrastructural material and photographic prints are obvious, the Museum is not equipped to handle these materials.

B. In turn, the National Museum of Natural History assumes the responsibility of maintaining the Collection by:

1. Declining to accept slide material not in satisfactory condition. The Museum operates on the principle, "Deposit slides in a condition in which you would like to find them." If valuable materials are badly preserved, stained, or mounted, the Museum requests some responsible investigator to refurbish them before deposition. The Museum does not wish to be responsible for the loss of or damage to original type material.
2. Identifying each slide with a lot accession number upon receipt. Such a number is reserved for any one group of slides received. Deposited slides will be stored numerically by accession number in "Technicon" slide cabinets. Type material will be housed separately. It is understood that all materials deposited become the property of the National Museum of Natural History upon their receipt.
3. Making collections available in full or in part to interested investigators and institutions. The duration of the loan will be negotiated, but is not expected to exceed one year. Loans are renewable each year upon request with justification. It is understood that all loaned materials will be carefully maintained.
4. Assigning catalogue numbers to type slides, especially for purposes of publication. Ideally all slides should be catalogued. Unfortunately, the shortage of staff does not allow such thoroughness.

*Material may be designated as any one of the following:

- a. Syntypes--all slides in a series of type slides of a species prior to singling out a holotype or lectotype specimen.
- b. Holotype--a single slide which constitutes the "type specimen" on which a new species description is based.
- c. Lectotype--a syntype designated as the "type specimen" subsequent to the original publication of the description of a type species if no holotype was designated by the author at the time of publication. Designator may be anyone with legitimate access to the type material.
- d. Paratype--a syntype remaining after the express designation of a holotype.
- e. Paralectotype--all the remaining original syntypes of a type series after a lectotype has been designated.
- f. Neotype--a single slide designated as the "type specimen" of a species for which the original type series material has been totally lost. It is derived from entirely fresh material due to the loss of the original specimen.

These definitions are based on those presented by Dr. John O. Corliss in his article listing the Ciliate Collection deposited in the Museum of Natural History (Trans. Amer. Micros. Soc. 91:221-235, 1972). His interpretation of how these concepts apply to protozoa are invaluable.

Continued on page 8

