sip newsletter

SOCIETY FOR INVERTEBRATE PATHOLOGY EDITOR: L. P. S. VAN DER GEEST

VOL. III, NO. 3 MAY 25, 1971

FOURTH ANNUAL MEETING OF THE SOCIETY FOR INVERTEBRATE PATHOLOGY, UNIVERSITE DES SCIENCES ET TECHNIQUES DU LANGUEDOC MONTPELLIER, FRANCE

JUNE 16-19, 1971

This Meeting is organized jointly with the Symposium of the Commission of Insect Pathology and Biological Control of the "Organisation Internationale de Lutte Biologique (O.I.L.B.), West Paleartic Regional Section", under the auspices of the Université des Sciences et Techniques du Languedoc, Montpellier, and of the "Institut National de la Recherche Agronomique" (I.N.R.A.).

The Meeting will be held in the Administration Building of the Université des Sciences et Techniques du Languedoc, Place Eugène Bataillon, Montpellier.

GENERAL INFORMATION

Registration. Final registration and assignmentof housing will take place in the Administration Building of the University where a registration desk will be opened from 10:000 a.m. to 8:00 p.m. Tuesday, June 15 and from 8:00 a.m. to 5:00 p.m. on Wednesday, June 16. Telephone number: 72-29-44 or 72-42-01, ask operator "poste congrès".

Housing . The participants will be housed in hotels in Palavas, on the sea shore, approximately 10 miles from Montpellier. Transportation by bus will be secured in the morning from Palavas to the University and back after the afternoon session. Departure from the hotels: 8:15 a.m.

The weather in Montpellier at this time of the year is usually warm and dry. Palavas is on the beach, don't forget your swimming suit.

Meals. It will be possible to have lunch in the University cafeteria. Purchase of tickets (11 francs) at the registration desk.

Arrival. At both airports of Nimes-Garons and Montpellier-Fréjorgues and at Montpellier railway station there will be on June 15 and 16 representatives of the Society to welcome participants and secure transportation to the University. Participants arriving by car are requested to report at the registration desk. After 8:00 p.m. participants will be transported directly to their hotels. If you have transportation or housing problems after 8:00 p.m., please call Hotel Brasilia, Palavas, telephone number: 29-00-68. In case of special problems concerning arrival, please write to:

Secretary of the IVth Annual Meeting
of the S.I.P. Station de Recherches
Cytopathologiques
30 - SAINT-CHRISTOL-LES-ALES, France

GENERAL PROGRAM

Tuesday , June 15	Evening.	S.I.P. Executive Council Meeting.
Wednesday , June 16	10:00 a.m.	Opening of the Meeting. - P.Dumontet, President of the Université des Sciences et Techniques du Languedoc, Montpellier. - J.Bustarret, General Director of the Institut National de la Recherche Agronomique (INRA). - C.Vago, President of The Society.
	11:00 a.m.	Business meeting of the Society.
	2:00-5:30 p.m.	Session on Virus Diseases.
	Evening.	Cocktail party in the Botanical Garden, Montpellier, offered by the Institut National de la Recherche Agronomique (INRA).
Thursday , June 17	9:00-12:00 a.m.	Session on Physiopathology.
	9:00 a.m.	Symposium of the Division of Microsporidia on "Current Problems in the Morphology and Host-Parasite relationship in Microsporidia".
	2:00-5:00 p.m.	Session on Bacterial, Rickettsial and Fungal diseases.
	2:00 p.m.	Discussion on Health hasards of Microbial Pesticides.
	Evening.	Society's Annual Banquet in the "Cevennes" mountains.
Friday , June 18	9:00-12:00 a.m.	Symposium of the O.I.L.B. on "Epizootiology and Ecopathology of Insect Pathogens".
	9:00 a.m.	Symposium on "Small Icosahedric Viruses of Drosophila and Bee".
	2:00-4:00 p.m.	Session on Pathology of Marine Invertebrates.
	4:00-5:00 p.m.	Projection of films.
Saturday , June 19	Excursion.	
	8:30 a.m.	Departure from Palavas to Saint-Christol. Visit of the Station de Recherches Cytopathologiques. Lunch near the roman "Pont du Gard" offered by the Organisation Internationale de Lutte Biologique (O.I.L.B.).
		Closing of the meeting, E.Biliotti, President of the Organisation Internationale de Lutte Biologique (O.I.L.B.), West Paleartic Regional Section.
		Trip to Camargue. Arrival in Palavas in the Evening.

The Social Program: Cocktail Party, S.I.P. Banquet and Saturday Excursion is free for all registered participants.

SESSION ON VIRUS DISEASES

Wednesday Afternoon, June 16

Chairmen: T.W.TINSLEY, L.J.VASILJEVIC

14:00-14:15	Replication of Choristoneurs fumiferana nuclear polyhedrosis virus in serially transferred cultures of Malacosoma disstria hemocytes	S.S.Sohi and F.T.Bird
14:15-14:35	Comparative ultrastructure of icosahedral cytoplasmic deoxyriboviruses	D.B.Stoltz, D.M.Davies, and M.D.Summers
14:35-14:50	Phénomène de "release" des virions dans la polyèdrose nucléaire du Lépidoptère Hyphantria cunea Drury	M.Injac, C.Vago, J.L.Duthoit and J.C.Veyrunes
14:50-15:10	Nuclear polyhedrosis virus infection of the larval midgut cells of Trichoplusia ni	C.Y.Kawanishi and H.J.Arnott
15:10-15:25	The iridescent virus of Wiseana cervinata; its properties and relationships with other viruses	J.S.Robertson
15:25-15:40	Discussion.	
15:40-15:55	Coffee break.	
15:55-16:10	Structural proteins of two small DNA viruses . .	R.MacLeod, J.F.Longworth and T.W.Tinsley
16:10-16:25	Biochemical and biophysical characterization of the DNA of a granulosis virus of Trichoplusia ni	M.D.Summers
16:25-16.40	Purification de différents virus libres d'invertébrés en rotor zonal	A.Giauffret and Ch.Vitu
16:40-16:55	Further studies on the virus diseases of larvae of Melanophila picta Pall	C.Sidor and M.Belic
16:55-17:10	Purification of virions and partial characterization of proteins of an Entomopoxvirus	W.McCarthy and D.W.Roberts
17:10-17:25	Discussion	

SESSION ON PHYSIOPATHOLOGY

Thursday Morning, June 17

Chairmen: G.BENZ, J.D.BRIGGS

9:00- 9:15	Réaction hémocytaire de granulome au cours d'infections par des champignons de pouvoir pathogène différent	A.Vey
9:15- 9:30	Defence reactions in Insects: Non-cellular encapsulation of parasites in the haemolymph of chironomid larvae (Dipt.)	P.Götz
9:30- 9:45	La formation du granulome chez quelques Orthopteroides	G.Matz
9:45-10:00	Etude ultrastructurale de la formation des capsules hémocytaires autour de fragments de cellophane implantés dans la cavité abdominale de Locusta migratoria (Orthoptère) . .	J.A.Hoffmann and G.Matz
10:00-10:15	Discussion	
10:15-10:30	Coffee break	
10:30-10:45	Protein changes in the haemolymph of Galleria mellonella larvae infected with virus and protozoan pathogens	J.Weiser and O.Lysenko
10:45-11:00	Aspects of radiation pathology in Hylemya antiqua	J.Theunissen
11:00-11:15	Effect of gamma radiation on selected tissues of larvae of Hemerocampa leucostigma	H.W.Rossmoore, L.M.Elder and H.Mintz
11:15-11:30	The role of non-cholinergic neurotransmitters in the response of Choristoneura larvae to nerve poisons	R.F.Smith
11:30-11:45	Effect of a vertebrate corticosteroid on hemocytes of Hemerocampa leucostigma: a preliminary report	H.W.Rossmoore and R.Rydstedt
11:45-12:00	Discussion	

SESSION ON BACTERIAL, RICKETTSIAL AND FUNGAL DISEASES

Thursday Afternoon, June 17

Chairmen: B.HURPIN, J.WEISER

14:00-14:15	Proposed changes in the nomenclature of milky disease bacteria	Ch.Wyss, P.Lüthy and L.Ettlinger
14:15-14:25	Some properties of the crystalline endotoxin of Bacillus thuringienses	B.Trümpy and P.Lüthy
14:25-14:35	Etude comparée en immunofluorescence de l'infection par Rickettsiella grylli chez son hôte et chez la souris	G.Meynadier and G.Croizier
14:35-14:50	Ultrastructure and development of Rickettsiella chironomi	P.Götz
14:50-15:00	Etude au microscope électroniques des symbiotes de plusieurs espèces de Thysanoptères	G.Louis and A.Bournier
15:00-15:15	Discussion	
15:15-15:30	Coffee break	
15:30-15:40	Recherches sur l'étiologie de la "léthargie" du Coléoptère Melolontha melolontha L.	C.Vago, J.Giannotti, G.Meynadier, G.Devauchelle and J.L.Duthoit
15:40-15:55	Infection au laboratoire des larves de Leptinotarsa decemlineata Say par Beauveria bassiana (Bals.) Vuillemin en présence de doses réduite de DDT . .	J.Fargues and P.Ferron
15:55-16:10	Mycose à trichomycètes chez les Arthropodes . . .	J.F.Manier
16:10-16:25	A trichomycete occurring on the cuticle of mosquito larvae	D.W.Roberts and H.C.Chapman
16:25-16:35	Fusarium oxysporum Schelecht pathogenic to mosquito larvae	S.Hasan
16:35-16:45	Infection de blessures par Fusarium solani (Mart.) Appel et Wollenw., chez l'écrevisse Austropotamobius (Allentoastacus) pallipes Lereboullet	A.Vey
16:45-17:00	Discussion	

SESSION ON PATHOLOGY OF MARINE INVERTEBRATES

Friday Afternoon, June 18

Chairmen: S.Y.FENG, O.TUZET

14:00-14:20	Incidence of gonadal cancer in the quahaug, *Mercenaria mercenaria*	M.M.Barry
14:20-14:40	Research into oyster diseases in the United Kingdom	D.J.Alderman
14:40-14:55	Light and electron microscopy of the leucocytes of *Crassostrea virginica* (Mollusca: Pelecypoda)	S.Y.Feng, J.S.Feng, C.N.Burke and L.H.Khairallah
14:55-15:10	Un nouveau type de virose chez les crustacés marins	J.R.Bonami, C.Vago and J.L.Duthoit
15:10-15:30	Studies on cytological effects in tissue cultured cells caused by antimetabolites derived from marine invertebrates	J.T.Cecil and R.F.Nigrelli
15:30-15:45	A virus disease of *Carcinus maenas*	F.B.Bang
16:00-16:15	Coffee break	

16:15 PROJECTION OF FILMS:

- Standardization of insect viruses . . . . . A.R.Chauthani
- Cycle biologique du Trichomycete *Amoebidium parasiticum* Cienkowski . . . . . J.F.Manier and A.Raibaut
- Polyhedral virus diseases in insects . . . . . C.Vago

SYMPOSIA

-The following symposia will be held during the meeting, simultaneously with the regular sessions:

SYMPOSIUM ON

"CURRENT PROBLEMS IN THE MORPHOLOGY AND HOST-PARASITE RELATIONSHIP IN MICROSPORIDIA"

Thursday Morning, June 17

This symposium is organized by the Division of Microsporidia, Dr.VAVRA, Chairman.

The following papers for this Symposium have been submitted:

- Etude ultrastructurale sur le plasmode sporogonal de Metchnikovella wohlfarthi (Hildebrand et Vivier 1971), microsporidie parasite de la grégarine Lecudina tuzetae . . . . H.Hildebrand
- A new microsporidian Pleistophora waltairensis from a dermapteran insect, Euborellia plebeja (Dohrn) (=E.stalli). . . C.Kalavati and P.N.Ganapati
- Tuzetia, nouveau genre créé pour des Microsporidies à pansporoblaste monosporé . . . . . J.Maurand A.Fize, B.Fenwick and R.Michel
- Continuous propagation of a microsporidian in a cell line established from Malacosoma disstria hemocytes . . . . . S.S.Sohi
- Development of Glugea disstria in long term ovarian tissue culture of Malacosoma disstria . . . . . S.S.Sohi and G.G.Wilson
- Origine et formation du filament polaire chez la microsporidie Nosema vivieri (V.D. et P., 1970) . . . . . D.Vinckier
- Observations sur la position systématique des Metchnikovellidae . . . . . E.Vivier
- Host specificity and host range as symptoms used in microsporidian taxonomy . . . . . J.Weiser
- Influence of different hosts on microsporidian morphology . . . . . J.Weiser

DISCUSSIONS FOR THE PREPARATION OF A SYMPOSIUM (1972 annual meeting) to be entitled "POSSIBLE HEALTH HAZARDS TO MAN AND ANIMALS ASSOCIATED WITH THE FUTURE USE OF MICROBIAL PESTICIDES" ORGANIZER - Dr. Marshall La

Thursday Afternoon, June 17

SYMPOSIUM ON "SMALL ICOSAHEDRIC VIRUSES OF DROSOPHILA AND BEE"

Friday Morning, June 18

Chairman: N. PLUS

ABSTRACTS OF PAPERS

SESSION ON VIRUS DISEASES

Wednesday afternoon, June 16

Replication of Choristoneura fumiferana nuclear polyhedrosis virus in serially transferred cultures of Malacosoma disstria hemocytes. S.S.SOHI and F.T.BIRD
Department of Fisheries and Forestry, Insect Pathology Research Institute, P.O.Box 490, Sault Ste Marie, Ontario, Canada.

The nuclear polyhedrosis virus (NPV) of Choristoneura fumiferana was found to infect Malacosoma disstria hemocyte cultures. Two series of cultures were used; the cells of the first (IPRI 66) had been in vitro for 368 days and those of the second (IPRI 108) for 192 days. Cells of both the series had been subcultured several times before they were used in these experiments. Polyhedra were seen in nuclei 3-5 days after inoculation of cultures with virus; replication of virus and occlusion of virions in polyhedra was confirmed in infected cultures by electron microscopy. In preliminary experiments, healthy C. fumiferana larvae became infected with NPV when injected with infected cultures. Virus was maintained in cell cultures for 4 passages.

o

Comparative ultrastructure of icosahedral cytoplasmic deoxyriboviruses. D.B.Stoltz (1), D.M.DAVIES (2) and M.D.SUMMERS (1), Cell Research Institute, University of Texas, Austin, Texas, U.S.A. (1) and Department of Biology, McMaster University, Hamilton, Ontario, Canada (2).

The structures of three different insect icosahedral cytoplasmic deoxyriboviruses (ICDV), TIV, Chironomus ICDV, and MIV, are compared; the observations have led to the proposal of a general structural model for this type of virus. Specifically, the ICDV shell appears to consist of a unit membrane modified by the apposition of an icosahedral lattice of morphological subunits. A second unit membrane is closely associated with, or is a part of, the virus nucleoid or core. The two membrans are closely appressed at the periphery of mature intact virus particles. Similarities between ICDV's of insect, vertebrate, and other hosts are noted. It is suggested that the phenomenon of iridescence not be regarded as a major criterion in the classification of ICDV's of insect, or other, origin.

o

Phénomène de "release" des virions dans la polyèdrose nucléaire du Lépidoptère Hyphantria cunea Drury. M.INJAC (1), C.VAGO (2), J.L.DUTHOIT (2) et J.C.VEYRUNES (2) Laboratoire de Lutte Biologique, Banatska 33, Beograd-Zemun, Yugoslavia (1) et Station de Recherches Cytopathologiques, 30-Saint-Christol-les-Alès, France (2).

Pendant la virogénèse de la polyèdrose nucléaire chez le Lépidoptère Hyphantria cunea, tous les virions ne sont pas inclus dans les cristaux protéiniques. Certains d'entre eux, dépourvus d'enveloppe, viennent s'accoler à la membrane nucléaire interne qu'ils traversent englobés dans une vésicule. Cette dernière repousse la membrane nucléaire externe jusqu'au contact de la membrane cytoplasmique. Ces virions ainsi protegés de tout contact avec le cytoplasme, sont ensuite expulsés de la cellule. Ce mécanisme de libération active semble participer à la contamination des autres cellules sensibles.

o

Nuclear polyhedrosis virus infection of the larval midgut cells of Trichoplusia ni. C.Y.KAWANISHI and H.J.ARNOTT, Cell Research Institute, Department of Botany, University of Texas, Austin, Texas 78712, U.S.A.

The invasion, replication, and release processes of the Rachiplusia ou nuclear polyhedrosis virus (RONPV) in the midgut cells of T. ni were studies. These processes appear to be similar to those reported for other nuclear polyhedrosis and granulosis viruses. The RONPV virions may contain one or more nucleocapsids within an envelope and these appear to enter the cells as a unit. After replication and assembly of progeny nucleocapsids within the nucleus, the particles pass into the cytoplasm, accumulate in the basal regions of the cells, and are subsequently released. The release process will be discussed in full.

o

The iridescent virus of Wiseana cervinata. Its properties and relationships with other viruses. J.S.ROBERTSON, Unit of Invertebrate Pathology, Commonwealth Forestry Institute, South Park Road, Oxford, U.K.

The iridescent virus Type 9 ex Wiseana cervinata has only been recorded from an isolated locality in New Zealand. In this locality iridescent viruses have also been recorded from two additional insect species (Witlesia and Odontria species). Difficulties have arisen in the purification of the virus and density gradient centrifugation has shown the existence of two populations of virus particles. The significance of this is discussed.
Chemical and serological studies are decribed which indicate that the virus is related to other iridescent viruses.

o

Structural proteins of two small DNA viruses. RODERICK MACLEOD, J.F.LONGWORTH and T.W.TINSLEY, Unit of Invertebrate Virology, Commonwealth Forestry Institute, South Park Road, Oxford, U.K.

Two DNA viruses from Galleria mellonella and Junonia coenia have been examined by polyacrylamide electrophoresis. The structural proteins profiles have been established, molecular weights and relative concentrations determined. The host ranges of these two viruses are widely different as are some of their physical chemical porperties. However, the structural proteins appear to be identical in number and size and the viruses share common antigens.

o

Biochemical and biophysicall characterization of the DNA of a granulosis virus of Trichoplusia ni. MAX D.SUMMERS, Cell Research Institute, University of Texas, Austin, Texas 78712, U.S.A.

The DNA of a granulosis virus of Trichoplusia ni has been isolated and characterized by chemical and physical techniques. The DNA genome sedimented in sucrose gradients at levels of 40S, 57S and 74S under conditions which utilized the proper concentrations of deoxyribonuclease and ascorbate exposure. The differently sedimenting bands are believed to correspond to linear, circular and superhelical duplexes with a estimated molecular weight of 39.0×10^6 daltons. A brief evaluation of the significance of these different forms and the technique of handling will be presented.

Purification de differents virus libres d'invertebrés en rotor zonal. A.GIAUFFRET et Ch.Vitu, Laboratoire de Recherches Vétérinaires, 63 Avenue des Arènes, Nice, France.

L'utilisation de la technique d'ultra centrifugation en rotor zonal permet d'envisager l'emploi des gradients de densité sur des volumes importants, avec des accélérations élevées (Pour le rotor BXIV en titane que nous avons utilisé 47.000tr/mn soit 55'000 à 165,000 x g pour un volume de 650 ml.)
La purification en gradient de saccharose a été expérimentée pour les virus suivants; l'agent de la densonucléose de Galleria mellonella (Groupe pico DNA), un entérovirus d'abeilles (Groupe pico RNA) et le virus de la Paralysie- Maladie Noire de l'abeille (virus polymorphe à RNA).

La méthode permet de réaliser une purification poussée et une concentration importante à partir de grands volumes (100 à 400 ml.) d'extraits bruts, clarifies seulement par une centrifugation à basse vitesse.
Le rendement et le degré de purification ont été appréciés en spectrophotométrie et en microscopie électronique. Les résultats, pour un cycle unique en rotor zonal, apparaissent nettement supérieurs à ceux qui peuvent être obtenus après plusieurs cycles de centrifugation différentielle classique.
Cette technique peut être considerée actuellement comme la méthode de choix pour toutes les préparations destinées à des études biochimique ou à la production d'antigènes purifiés en quantité notable.

o

Further studies on the virus disease of larvae of Melanophila picta Pall. CIRIL SIDOR and MIRJANA BELIĆ, Institut Pasteur and Department of Histology and Embryonology, Faculty of Medecine, Novi Sad, Yugoslavia.

According to our information, first data on virus disease of Melanophila picta Pall. / Coleptera, Buprestidae / were obtained in Vojvodina / north part of Yugoslavia / on big poplar plantations. The majority of dead and sick larvae from virus disease were found mostly under the bark of young poplar trees. Dead larvae under the bark of the affected trees become dry and do not decay for a longer time.tailed investigation of dead larvae showed numerous polyhedral inclusions especially in the fatbody. In this paper we present the results of investigation of histological changes of affected tissue as well as examination of the inclusion bodies and the virions under the electron microscope.
After our data the virus disease of M.picta belongs to an important factor which influences on the regulation of density population of the mentioned pest.
The results of the above mentioned investigations are confirmed by light and electron microscope photos.

o

Purfication of virions and partial characterization of proteins of an Entomopoxvirus. WILLIAM McCARTHY and DONALD W.ROBERTS, Boyce Thompson Institute for Plant Research, 1086 North Broadway, Yonkers, N.Y. 10701, U.S.A.

Virions of an Entomopoxvirus were isolated from inclusions produced in larvae of Estigmene acrea (Lepidoptera:Arctiidae). Improvements in the isolation technique have afforded preparations with all four enzymes reported for vertebrate poxviruses and have reduced the amount of aggregation of virions. Purified virus preparations have been compared as to infectivity, optical density, protein, and DNA. The proteins of virions were analyzed by SDS-acrylamide gel electrophoresis and the molecular weights determined using a number of gel conditions. Twelve or thirteen protein bands were regularly present in the gels and molecular weights ranged from 15.000 to 19.000. Four major bands with molecular weights from 88.000 to 125.000 were-detected in protein preparations obtained from virus containing inclusions which were dissolved carefully to minimize virion dissolution.

SESSION ON PHYSIOPATHOLOGY

Thursday morning, June 17

Réaction hémocytaire de granulome au cours d'infections par des champignons de pouvoir pathogène différent. ALAIN VEY, Station de Recherches Cytopathologiques, INRA-CNRS, 30-Saint-Christol-les-Alès, France.

Chez les insectes infectés par un agent faiblement pathogène (Aspergillus niger) se constituent des formations à structure serrée dénommées granulomes.
Vis à vis de Mucor hiemalis, parasite de blessures, la réaction hémocytaire débute de même manière mais s'avère précocement inefficace par suite de la rapidité de croissance des hyphes. Ce processus s'affaiblit en fin de maladie, sans doute sous l'influence de toxines fongiques.
Au cours des infections par un agent fortement pathogène, comme Beauveria bassiana, des perturbations apparaissent dans la réaction de granulome: diminution du nombre de cellules intervenant, perte de leur aptitude à s'étaler et se serrer, altération de ces hémocytes, faible importance de la mélanisation. Ces phénomènes paraissent s'expliquer par l'action des toxines libérées par le Beauveria. La réaction de granulome parvient cependant parfois à protéger l'hôte même contre ce cryptogame.

o

Defence reactions in insects: Non-cellular encapsulation of parasites in the haemolymph of chironomid larvae (Dipt.). PETER GÖTZ, Zoologisches Institut der Universität, Katharinenstrasse 20, D-78 Freiburg, West-Germany.

Encapsulation by blood cells is a common defence reaction of insects and other invertebrates against parasites. In larvae of Chironomus (Diptera:Chironomidae) certain parasites (Nematoda:Mermithidae) are encapsulated without participation of haemocytes. The components of this reaction, which leads to the formation of a cell free capsule around the nematode, are dissolved in the haemolymph. In vitro the precipitation of the capsule formating substance begins already 2-5 minutes after the addition of a parasite into the isolated haemolymph. Under the electron microscope in vivo and in vitro formed capsules look completely alike. This encouraged us to use the in vitro system for further investigation. Comparing the ultrastructure of capsules formed by non-cellular (Chironomus, Aedes) and by cellular (most other arthropods) encapsulation we found one striking correspondence: in both cases a characteristic electrondense material seals completely the surface of the parasite. This substance is either deposited by accumulated blood cells (cellular encapsulation) or precipitated immediately out of the haemolymph (non-cellular encapsulation). The chemical nature of the capsule substance and the control of its deposition, as investigated in Chironomus, are discussed).

o

La formation de granulome chez quelques Orthopteroides. GILBERT MATZ, Laboratoire de Biologie animale, Centre Universitaire Angers, B.P. 2001 Bell Beille, 49-Angers, France.

L'implantation d'un corps étranger (fragment de feuille de cellophane) dans la cavité hémolymphatique des Insectes provoque un encapsulement hémocytaire qui formera le "granulome". Celui-ci évolue différemment suivant les conditions expérimentales (espèce considérées, stérilité ou non-stérilité de l'implant, etc.) Chez Blabera craniifer, le granulome résulte de l'accumulation d'hémocytes, sans autre évolution. Chez Locusta migratoria, il se différencie une capsule fibrillaire. Enfin, chez plusieurs espèces (Locusta migratoria, Leucophaea maderae, Periplaneta americana) une réaction épithéliale secondaire met en place dans la capsule hémocytaire, un

hypoderme sécrétant une cuticule. Cet hypoderme qui se forme à partir de l'hypoderme trachéen, plus rarement à partir de l'hypoderme tégumentaire, constitue une protection supplémentaire dans la défense de l'organisme contre le corps étranger.

Etude ultrastructurelle de la formation des capsules hémocytaires autour de fragments de cellophane implantés dans la cavité abdominale de Locusta migratoria (Orthoptère). JULES A.HOFFMAN et GILBERT MATZ, Laboratoire de Biologie générale, 12 Rue de l'Université, Strasbourg et Laboratoire de Biologie Animale, CSU, Avenue Lavoisier, Angers, France.

L'hémolymphe de Locusta migratoria renferme en circulation quatre types cellulaires bien définis: les plasmatocytes (phagocytes), les granulocytes typiques, les coagulocytes et les cenocytoïdes (1). L'implantation de fragments de cellophane provoque la formation d'une capsule hémocytaire (2) constituée essentiellement par les granulocytes typiques. Ceux-ci présentent des modifications caractéristiques dès le 2e jour après l'implantation. Le phénomène le plus frappant est l'apparition dans le cytoplasme des granulocytes typiques d'une grande quantité de microtubules. Ces cellules présentent de plus une accumulation de glycogène. Des transformations comparables sont observées dans le tissu hématopoïétique (3) après irradiation aux rayons X, dans les éléments entourant les foyers de nécrose. Les modifications cytoplasmiques particulières des éléments impliqués dans les réactions cicatricielles posent un certain nombre de problèmes et en particulier celui de la signification même des microtubules.

Protein changes in the hemolymph of Galleria mellonella larvae infected with virus and protozoan pathogens. JAROSLAV WEISER and OLEG LYSENKO, Laboratory of Insect Pathology, CSAV, Institute of Entomology, Flemingovo nám 2, Praha 6, Czechoslovakia.

The protein patterns of Galleria mellonella last larvae hemolymph consist of 16 distinguished bands in four groups. The change produced by two different kinds of infections, the densonucleosis virus and the microsporidian Nosema plodiae are demonstrated. Each infection is characterised by specific changes. The electropherogramme of the virus infected larva shows a very reduced fraction C and significant decrease of fractions A_4 and D_1. For the infection with microsporidia is typical a decrease in quantity of high-molecular fractions A_1, A_2 and A_3 and a relative increase of fractions D_{1-4}.

Even though these alterations cannot be explained in biochemical definitions of the discs and chemical changes producing different patterns can merely be estimated, typical shifts of some groups in some types of infections may be an useful link for diagnostics of different insect diseases.

Aspects of radiation pathology in Hylemya antiqua. J.THEUNISSEN, Institute for Phytopathological Research, Binnenhaven 12, Wageningen, the Netherlands.

Irradation of insects with ionizing radiation causes histopathological reactions to injured cells and tissues. These reactions can partially be described according to the terminology of invertebrate pathology and partially not. Some examples of the application on insect pathology are given.
Symptoms of radiation damage in Hylemya antiqua are described and discussed.

Effect of gamma radiation on selected tissues of larvae of Hemerocampa leucostigma. H.W.ROSSMOORE, L.M.ELDER and M.MINTZ, Department of Biology, Wayne State University, Detroit, Michigan 48202, U.S.A.

4th and 5th instar larvae of Hemerocampa leucostigma were irradiated at several dosages from 30 - 90 Kr in a ^{137}Cs radcell. The following tissues were examined at various intervals after radiation: midgut epithelial histology, hemocyte counts, hemolymph protein patterns. After one day as dose increase cells lose stainability and nuclei shrink, at 4 days there is separation and dissolution of the epithelial layer but no breaks in the basement membrane.
Hemocyte counts were unaffected until day 6 and at day 8 there was a dose dependent drop from 90 Kr of ca 40%. In hemolymph after 30 Kr a separate peak was detectable earlier and became more pronounced at 12 days. These observations may be related to change in susceptibility to infection following radiation that we noted previously.

o

The role of non-cholinergic neurotransmitters in the response of Choristoneura larvae to nerve poisons. RICHARD F.SMITH, U.S.D.A. Forest Service, Berkeley, California, U.S.A.

By treating sixth instar Choristoneura occidentalis larvae with drugs known to alter cholinergic of aminergic neurotransmission in vertebrates, the toxicity of three types of nerve poisons--pyrethrins, Lannate, and atropine--could be abolished or enchanced.

With the synaptic poisons, the balance or ratio between levels of acetylcholine and 5-hydroxytryptamine appeared to be more significant than their absolute concentrations. Toxic and/or juveno-mimetic responses were greatest under conditions favoring the elevation of one of these neurotransmitters and the lowering of the other. No toxic responses were obtained under conditions favoring the elevation or the lowering of both.

The implications of these findings, both theoretical (do insects have an autonomic nervous system?) will be discussed.

o

Effect of a vertebrate corticosteroid on hemocytes of Hemerocampa leucostigma; A preliminary report. H.W.ROSSMOORE and R.RYDSTEDT, Department of Biology, Wayne State University, Detroit, Michigan 48202, U.S.A.

Late 4th instar larvae of Hemerocampa leucostigma were injected intrahemocoelically with prednisolone sodium succinate at 2 dose levels. Hemocyte counts were done at 2-1/2 and 5 hour intervals following injection, with 0.25 ugm/larvae, there was 100% increase in hemocyte counts after 2-1/2 hours dropping off to 50% above control in 5 hours. The larger dose (2-1/2 ugm) raised counts 50% after 2-1/2 hours but apparently caused a significant drop in 5 hours. Additional times and doses are being explored.

o

SESSION ON BACTERIAL RICKETTSIAL AND FUNGAL DISEASES

Thursday afternoon, June 17

Proposed changes in the nomenclature of milky disease bacteria. Ch.WYSS, P.LüTHY and L.ETTLINGER. Department of Microbiology, Swiss Federal Institute of Technology, Universitätsstrasse 2, 8006 Zürich, Switzerland.

At present four species of milky disease bacteria are known: Bacillus popilliae, Bacillus fribourgensis, Bacillus lentimorbus and Bacillus euloomarahae. The taxonomic criteria for their differentiation are mainly based on morphology and host specificity. Improved in vitro culture techniques of the milky disease organisms rendered it possib e to study the physiology. Over the past few years the physiological characteristics of numerous milky disease strains were investigated and compared. Based on these results it is proposed that B. popillae, B. fribourgensis and B.lentimorbus are considered as one single species, name B. popilliae Dutky. This species includes so far the varieties B. p. popilliae Krieg, B. p. lentimorbus Dutky and B. p. melolonthae Hurpin.

o

Some properties of the crystalline endotoxin of Bacillus thuringienses. B.Trümpy and P.Lüthy, Institute of Microbiology, Swiss Federal Institute of Technology, Universitätsstrasse 2, 8006 Zürich, Switzerland.

Crystals of Bacillus thuringienses dissolve only under relatively drastic alkaline conditions. However, it has been found that crystals incubated in dilute NaOH, for example at a pH of 11.7, start to swell and reach at least four times their original size. The swelling is accompanied by the loss of refractility. If the NaOH is replaced by distilled water, the crystals shrink immediately back to their former size and regain the refractility. The toxic activities of swollen and normal crystals have been compared and no Loss of toxicity was measured even if the crystals were incubated over a period of two hours at the above mentioned pH.

o

Etude comparée en immunofluorescence de l'infection par Rickettsiella grylli chez son hôte naturel et chez la souris. G.MEYNADIER et G.CROIZIER, Station de Recherches Cytopathologiques, INRA-CNRS, 30-Saint-Christol-les-Alès, France.

L'apparition de plages fluorescentes homogènes, localisées dans le cytoplasme, constitue le premier signe de l'infection aussi bien chez le grillon que chez la souris. Chez le grillon inoculé dans la cavité générale le nombre de ces plages augmente au cours des cinq premiers jours, tandis que les rickettsies libres apparaissent. Par la suite les plages fluorescentes s'estompent et disparaissent alors que les rickettsies libérées envahissent le tissus adipeux en voie de lyse.

Chez la souris infectée par inhalation le développement des rickettsies reste circonscrit au poumon. Lors d'inoculations intrapéritonéales, les rickettsies se retrouvent dans les différents organes (foie, rate, péritoine, intestin grèle, sang et poumon). Les aspects de l'infection varient pour les différents tissus mais il est possible d'établir une séquence générale de l'évolution rickettsienne.

Aussitôt après l'infection les rickettsies libres sont observées dans tout l'organisme. Des plages fluorescentes homogènes, de taille variable selon le tissu, se forment dès les premières heures, elles libèrent dans les jours qui suivent des éléments rickettsiens. Une dizaine de jours après l'infection les plages se sont estompées et les rickettsies libérées disparaissent - seule une fluorescence diffuse persist dans le cytoplasme de certaines cellules.

Les observations présentées rendent compte du déroulement de la rickettsiose. Chez l'insecte la maladie évolue d'une façon irréversible alors que la souris contracte généralement une maladie bénigne qui dure moins de quinze jours.

o

Ultrastructure and development of Rickettsiella chironomi. PETER GÖTZ, Zoologisches Institut der Universität, Katharinenstrasse 20, D-78 Freiburg, West-Germany.

In 1968 Weiser and Zizka published the first electron microscope pictures of Rickettsiella chironomi. Our recent finding of larvae of Chironomus th. thummi infected with Rickettsiella chironomi enabled further investigation of this highly interesting organism. The ultrastructure and development of Rickettsiella chironomi has much in common with PLT-organisms, especially the ornithosis agent.

o

Etude au microscope électronique des symbiontes de plusieurs espèces de thysanoptères. C.LOUIS (1) et A.BOURNIER (2), Station de Recherches Cytopathologues, INRA-CNRS, 30-Saint-Christol-les-Alès, France (1) et Laboratoire de Zoologie, contre de Recherches Agronomiques, 34-Montpellier, France (2).

Nous avons trouvé des groupements de micro-organismes Procaryotes aux pôles antérieur et postérieur des ovocytes de trois espèces de Thysanoptères. Les caractéristiques ultrastructurales de ces micro-organismes, leur transmission transovarienne, leur groupement en "mycétomes embryonnaires" et le trajet que ces mycétomes effectuent au cours de l'embryogenèse indiquent qu'il s'agit bien de symbiotes, comparables à ceux qui d'observent dans les Ordres d'Insectes voisins.

o

Recherches sur l'étiologie de le léthargie du Coléoptère Melolontha melolontha. C.VAGO, J.GIANNOTTI, G.MEYNADIER, G.DEVAUCHELLE et J.L.DUTHOIT, Station de Recherches Cytopathologues, INRA-CNRS, 30-Saint-Christol-les-Alès et Laboratoire de Biologie Animale, Faculté des Sciences, 80-Amiens, France.

Les cellules adipeuses et nerveuses renferment des vacuoles comprenant des corps allongés de 600 à 700 mu, d'autres ovoïdes de 150 à 250 mu et d'autres encore plus pléomorphes. Ces différentes formes sont limitées par une seule membrane unitaire, leur structure interne comprend des fibrilles d'ADN, des granulations de type ribosomes. Ces éléments sont accompagnés par des formes dilatées d'1 u de diamètre ou d'avantage et aussi limitées par une membrane unitaire. Ces grandes formes contiennent du matériel nucléaire ou des faisceaux de fibres et des aggrégats de particules de 100 mu à centre clair. Tous les éléments mentionnés semblent d'inscrire dans le cycle de développement d'un micro-organisme. La structure de leur enveloppe et leur polymorphisme les rapprochent des mycoplasmes. Leur développement intravacuolaire rappelle celui de certaines rickettsies. Par la succession des formes et la formation des aggrégats, ce germe ne peut être assimilé à aucun type de micro-organismes connu.

o

Infection au laboratoire des larves de Leptinotarsa decemlineata Say par Beauveria bassiana (Bals).Vuillemin en présence de doses réduites de DDT. J.FARGUES et P.FERRON, INRA, Station de Recherches de Lutte Biologique et de Biocoenotique, La Miniere, 78-Versailles, France.

L'influence de la contamination des larves de Leptinotarsa decemlineata Say, par des condidiospores de Beauveria bassiana (Bals.) Vuillemin associées à des doses réduites de DDT, sur la mortalité totale et le développement de la mycose a été étudiées dans les conditions du laboratoire, Suivant les modalités de traitement, il est possible de réduire jusq'à 20 fois l'inocolum de Beauveria et jusqu'à 10 fois la dose d'insecticide par rapport aux quantités nécessaires pour obtenir la même efficacité lorsque les produits sont employés séparément. L'augmentation des cas de mycose à Beauveria est surtout sensible lorsque le substrat de nymphose des larves de doryphore est contaminé par une association des deux produits.

o

Mycose a Trichomycètes chez les Arthropodes. J.F.MANIER, Laboratoire de Zoologie, Université des Sciences et Techniques, Montpellier, France.

Les Trichomycètes sont des Phycomycètes parasites de Mandibulates terrestres, marins ou d'eau douce. Chaque ordre (Amoebidiales, Eccrinales, Asellariales, Harpellales) est brièvement présenté. Un tableau montre la répartition des Trichomycètes dans les différents ordres d''Arthropodes. Les relations hôtes-parasites sont abordées. En général, à chaque mue, l'Arthropode se débarasse de ses parasites. Cependant une intense prolifération des Amoebidium ralentit les mouvements des Cladocères et les rend plus vulnérables. L'organe d''accrochage des endoparasites soulève la paroi intestinale en provoquant une réaction cuticulaire. Une association Bactéries-Trichomycètes est fréquemment notée. Le Trichomycète est souvent la seule victime de cette association mais la prolifération bactérienne (notamment chez des larves de Diptères en élevage) peut entraîner des septicémies mortelles.

o

A Trichomycete occurring on the cuticle of mosquito larvae. DONALD W.ROBERTS (1) and HAROLD C.CHAPMAN (2), Boyce Thompson Institute for Plant Research, 1086 North Broadway, Yonkers, N.Y. 10701 (1) and U.S.D.A., A.R.S., E.R.D., Avenue J.Chennault, Lake Charles, Louisiana 70601, U.S.A. (2).

A Trichomycete which has no amoeboid stage and is similar to members of the Genistellales has been isolated from Aedes triseriatus larvae. Zygospores and spore "flagellae" were not observed. The fungus differs from all known non-amoeboid Trichomycetes in that (a) it occurs on virtually all portions of the cuticle rather than in the gut of the insect, and (b) it apparently caused some mortality of host larvae in the field. Several isolates of the fungus have been obtained. These are not fastidious and can be grown at 15° - 25° C on several agar media flooded with sterile water. Fungus grown at room temperature with aseptically reared Aedes aegypti larvae did not attach to the cuticle, but it did attach firmly to casein particles in the mosquito medium.

o

Fusarium oxysporum Schelecht, pathogenic to mosquito larvae. SIRAJUL HASAN, Station de Recherches Cytopathologiques, INRA-CNRS, 30-Saint-Christol-les- Alès, France.

Diseased larvae of Aedes detritus HAL. were collected from the Marshy areas of Camargue (S.France). The larvae of different instars were found sluggish and turned milkish white just before death. External mycelium appeared after the dead larvae were left in water for another two to four days and finally the cadavers

were enveloped in a network of fleshy and whitish mass of hyphae. The fungus isolated from diseased larvae has been identified as Fusarium oxysporum.
The larvae of A. detritus and also Culex pipiens L. have been infected experimentally on contaminating water by the conidia obtained from the fungal cultures as well as by diseased cadavers. The fungus caused more that 80% motality in C. pipiens. Injured larvae exposed to the fungal spores in water gave a higher mortality rate. Young larvae were more susceptible to fungal infection. Higher dose of nourishment increased the fungal activity in water cultures causing higher death rates too.

Current experiments have shown that infection with F. oxysporum is also successful in larger quantities of water. Thus the disease may be considered as a limiting factor for the mosquitoes and eventually its use in the biological control is worhty of further investigations.

o

Infection de blessures par Fusarium solani (Mart.) Appel et Wollenw. chez l'écrevisse Austropotamobius (Allantoastacus) pallipes Lereboullet. ALAIN VEY, Station de Recherches Cytopathologiques INRA-CNRS, 30-Saint-Christol-les-Alès, France.

Chez des individus d'A.pallipes nous avons observé un développement de F.solani au niveau de blessures, suivi de la mort de l'hôte. Cet agent s'est avéré très pathogène pour l'écrevisse lorsqu'il est inoculé.
Les essais d'infection d'individus non blessés, par contamination du milieu ou ingestion forcée, ont eu un résultat négatif. Par contre chez certains écrevisses blessés et placés en eau contaminée le champignon s'installe localement et provoque leur mort. Ensuite apparaissent en surface du corps des chlamydospores qui deviennent très nombreuses. Leur dissémination et leur aptitude à germer sur milieu favorable leur permettent d'infecter de nouveaux individus. Dans certain cas le cadavre vient flotter à la surface de l'eau et il se forme des conidiospores pouvant aussi contaminer le milieu. La maladie peut donc se répandre grace à un cycle complexe avec phase aérienne.

o

SESSION ON PATHOLOGY OF MARINE INVERTEBRATES

Friday afternoon, June 18

Incidence of gonodal cancer in the quahaug, Mercenaria mercenaria. MARCIA M.BARRY, Environmental Protection Agency, Water Quality Office, National Marine Water Quality Laboratory, Box 277, West Kingston, Rhode Island 02892, U.S.A.

Five hundred and thirty-nine Mercenaria mercenaria were collected from Rose Island, Narragansett Bay, Rhode Island. The animals were collected during the summers of 1969 and 1970. This study was designed to support earlier histopathological findings, which described the first cases of primary ovarian neoplasms, and to determine the incidence of gonadal cancers in the quahaug. Histological examination of 175 animals collected in 1969 revealed that 99 were females, out of which four had ovarian neoplasms. The remaining 76 animals were males and showed no evidence of gonadal morphological anomalies. Three hundred and sixty-four animals were collected in 1970. Of the 217 females examined, 8 had ovarian neoplasms, one of which had neoplastic invasion into the red gland and heart and could be recognized as malignant. One hundred and forty-seven animals in this group were males, two of which had testicular neoplasms which did not show the invasive properties of the ovarian tumor. Microscopical examination of both male and female gonadal neoplasms revealed that the morphological and the nuclear cytological characteristics of the tumors were identical and that both appeared to be of germ cell origin.

o

Research into oyster diseases in the United Kingdom. DAVID JAMES ALDERMAN, Department of Biological Sciences, Portsmouth Polytechnic, Hay St., Porthsmouth, England.

Recently it has been become apparent that several diseases are affecting flat oyster stocks in the United Kingdom. One of these, shell disease, found in most parts of W.Europe, has now been investigated. It is caused by a fungus growing in the oyster shell and causing irritation. The fungus has been isolated in culture and identified as Ostracoblabe implexa Born, et Flah. a halophilic phycomycete with an optimum temperature for growth of 30° C. Severe infections do not occur unless water temperatures in excess of 20° C persist. This disease is not normally of great economic significance.

A second disease of Portuguese oysters imported into England is of greater importance. Gill disease is a spring disease causing lesions of the gills, palps and mantle. Infections frequently reached 60% in four weeks from importation. The histopathology of the diseases as recognised in the United Kingdom has been investigated extensively but no evidence has been found of the presence of Thanatostrea polymorpha.
Finally, some examination of flat oysters from the Abers of Brittany has been made with a view to identifying the pathogen found in them by Comps, so that the U.K. authorities can avoid importing diseased stocks.

o

Light and electron microscopy of the Leucocytes of Crassostrea virginica (Mollusca: Pelecypoda). S.Y.FENG, J.S.FENG, C.N.BURKE and L.H.KHAIRALLAH. Marine Research Laboratory, University of Connecticut, Noank, Connecticut 06340, U.S.A.

The fine structure of oyster leucocytes resembles to a great extent, that of typical eucaryotic cells. Organelles which have been described for the first time in this report are light granules, dense granules, protocentriole and X structure. Light microscopy reveals two morphological types of oyster leucocytes: agranular and granular. Based upon nuclear morphology and cytoplasmic compositions revealed in electron microscopy, at least three types of agranular and one type of granular cells are recognized.
In the Giemsa-stained preparations, granular leucocytes exhibit three distinct types of cytoplasmic granules: refractile, dark blue and pink, which presumably correspond to light granules Type A, B and C seen in the electron micrographs. A granular leucocyte may contain one or more types of granules. Cytochemical investigations show that oyster leucocytes contain at least three hydrolytic enzymes: non-specific esterases, acid and alkaline phosphatase. The latter two enzymes constitute 63% of the enzyme activity detected. These intracellular enzymes may be associated with the light granules and/or lysosome-like bodies. It is also demonstrated that the granular leucocyte population is significantly higher ($P < 0.001$) in the oysters experimentally infected with Bacillus mycoides ($72.19 \pm 4.71\%$) as contrasted with that of the controls ($37.18 \pm 4.48\%$). Leucocytes in progressive stages of degeneration are also described.

o

Un nouveau type de virose chez les crustacés marins. J.R.BONAMI, C.VAGO et J.L.DUTHOIT. Laboratoire de Pathologie Comparée, Université des Sciences, 34-Montpellier, France.

Une maladie mortelle a été découverts dans les populations naturelles du crustacé décapode Macropipus depurator sur la côte camarguaise de la Méditerrannée. L'agent est un virus de 160 à 300 mu, assez polymorphe ovoïde entouré d'une enveloppe composée de sous-unités. La suspension purifiée de ce virus neutrotrope reproduit la maladie par injection. La localisation des virions dans le cytoplasme des cellules cardiaques a été montrée. L'étude ultrastructurale des virions est en cours en vue de la classification.

o

Studies en cytological effects in tissue cultured cells caused by antimetabolites derived from marine invertebrates. JACK T.CECIL and ROSE F.NIGRELLI. Osborn Laboratories of Marine Sciences, New York Aquarium, Boardwalk at W.8th St.Brooklyn, New York 11224, U.S.A.

Water soluble antimetabolites from Echinodermata (Actinopyga agassizi, Holothuria mexicana, Stichopus multifidus, Nemaster rubiginosa), and from the Bryozoan Amathia convoluta., induce cytological abnormalities in human oral carcinoma (KB) and a "transformed" cell line from Gray Seal Kidney (GSK) in continuous passage. Cells were grown as monolayers to which the antimetabolites were applied, or cells were grown in medium containing dilutions of the water soluble extracts varying from 25-200 mcg/ml. All extracts are cytotoxic at concentrations of 200 mcg/ml. Lower concentrations (25-50 mcg/ml) caused cellular changes that included granulation, development of crystalline-like substances, increased granular RNA, and cytoplasmic vacuolation. Other changes noted were elongated or "dumbell" shaped cells, and cells with cytoplasmic bridges and processes. None of the extracts caused gross nuclear abnormalities; an occasional "budding" nucleoli was seen. Observations were made by fluorescent microscopy of Acridine-orange stained preparations or by transmitted light microscopy of hematoxylin-eosin stained materials.

This research was supported by a grant from the Scaife Family Foundation to the Osborn Laboratories of Marine Sciences.

o

A virus disease of Carcinus maenas. FREDERIK B.BANG, Department of Pathobiology John Hopkins University School of Hygiene and Public Health, 615 North Wolfe Street, Baltimore, Maryland 21205, U.S.A.

No abstract received.

o

The fine structure of oyster leucoc
typical eucaryotic cells. Organel
time in this report are light a
structure. Light microscopy r
agranular and granular. Bas
revealed in electron micr
granular cells are reco
In the Giemsa-stained
types of cytoplasmic
correspond to ligh
A granular leuco
investigations
enzymes: non-
enzymes co
may be a
demonst
(P C
(77
I

Department of Pathobiology John
615 North Wolfe Street,

PAGE 21

M ON

J THE MORPHOLOGY AND

SHIP IN MICROSPORIDA"

y morning, June 17

ogonal de Metchnikovella wohlfarthi
parasite de la gregarine Lecudina
stologie et Microscopie électronique,
ences et Technique de Lille I, France.

les plasmodiaux de la Microsporidie
vier 1971) permet l'observation de
oupe de Grégarine. Ces plages, étudi-
s libes d'un seul plasmode sporogonal

mbranes unitaires dont l'externe
arasitaire). Ces 2 membranes existent
ourent de nombreuz sporoblastes.

[redacted] contient des ribosomes extrêmement abondants et des membranes ergastoplasmiques qui sont généralement organisées en couches parallèles ou concentriques autour ou à proximité des noyaux. Il n'existe ni mitochondrie ni appareil de Golgi classique. On rencontre, cependant, de nombreuses vésicules dispersées dans le cytoplasme, parfois plus ou moins agglomérées à proximité d'un noyau; dans ce dernier cas, ces vésicules pourraient représenter un dictyosome primitif.
Les noyaux ont une enveloppe nucléaire classique mais ne montrent pas de nucléole différencié. Des faisceaux de microtubules intranucléaires sont fréquemment observables et partent de deux pôles opposés. Au niveau de ceux-ci l'enveloppe nucléaire est déprimée et présente une opacité qui est l'équivalente d'un centrosome.

o

A new microsporidian, Pleistophora waltairensis, from a dermapteran insect, Euborellia plebeja (Dohrn) (=E.stalli). C.KALAVATI and P.N.GANAPATI, Department of Zoology, Andhra University, Waltair, Andhra Pradesh, India.

A new microsporidian parasite, Pleistophora waltairensis n.sp. found in the epithelium of malpighian tubules of a dermapteran insect, Euborellia plebeja (Dohrn) (=E.stalli Dohrn) is described. The schizonts and sporonts are found in the epithelium of the malpighian tubules. The pansporoblast varies in size from 9.0u - 25.0u in diameter and has a thin transparant limiting membrane. The number of spores formed from each pansporoblast depends upon the size but the number is never less than sixteen. The spores are oval in shape and measure 5.4u x 2.0u in fresh preparations. Two vacuoles, one at either pole of equal size are present in the spore. Spores stained with Giemsa after an initial hydrolysis with IN-HCL for ten minutes revealed the cytoplasm in the form of a faintly stained coiled filament lying within the spore but all attempts to release the polar filaments were unsuccessful. Spores stained according to the PAS technique revealed the presence of a PAS positive polar cap at the anterior end.
The systematic position and the host-parasite relations are discussed.

o

SYMPOSIUM ON
"CURRENT PROBLEMS IN THE MORPHOLOGY AND HOST PARASITE RELATIONSHIP IN MICROSPORIDA"

Thursday morning, June 17

Etude ultrastructurale sur le plasmode sporogonal de Metchnikovella wohlfarthi (Hildebrand et Vivier 1971), microsporidie parasite de la gregarine Lecudina tuzetae, H.HILDEBRAND, Laboratoire de Protistologie et Microscopie électronique, Département de Biologie, Université des Sciences et Technique de Lille I, France.

L'étude au microscope électronique des stades plasmodiaux de la Microsporidie Metchnikovella wohlfarthi (Hildebrand et Vivier 1971) permet l'observation de nombreuses plages parasitaires sur chaque coupe de Grégarine. Ces plages, étudiées en coupes sériées, se révèlent comme des libes d'un seul plasmode sporogonal pourvu de nombreuz noyaux.
La paroi du plasmode est constituée de 2 membranes unitaires dont l'externe appartient probablement à l'hôte (vacuole parasitaire). Ces 2 membranes existent toujours au stade pansporoblastique et entourent de nombreuz sporoblastes.
Le cytoplasme contient des ribosomes extrêmement abondants et des membranes ergastoplasmiques qui sont généralement organisées en couches parallèles ou concentriques autour ou à proximité des noyaux. Il n'existe ni mitochondrie ni appareil de Golgi classique. On rencontre, cependant, de nombreuses vésicules dispersées dans le cytoplasme, parfois plus ou moins agglomérées à proximité d'un noyau; dans ce dernier cas, ces vésicules pourraient représenter un dictyosome primitif.
Les noyaux ont une enveloppe nucléaire classique mais ne montrent pas de nucléole différencié. Des faisceaux de microtubules intranucléaires sont fréquemment observables et partent de deux pôles opposés. Au niveau de ceux-ci l'enveloppe nucléaire est déprimée et présente une opacité qui est l'équivalente d'un centrosome.

o

A new microsporidian, Pleistophora waltairensis, from a dermapteran insect, Euborellia plebeja (Dohrn) (=E.stalli). C.KALAVATI and P.N.GANAPATI, Department of Zoology, Andhra University, Waltair, Andhra Pradesh, India.

A new microsporidian parasite, Pleistophora waltairensis n.sp. found in the epithelium of malpighian tubules of a dermapteran insect, Euborellia plebeja (Dohrn) (=E.stalli Dohrn) is described. The schizonts and sporonts are found in the epithelium of the malpighian tubules. The pansporoblast varies in size from 9.0u - 25.0u in diameter and has a thin transparant limiting membrane. The number of spores formed from each pansporoblast depends upon the size but the number is never less than sixteen. The spores are oval in shape and measure 5.4u x 2.0u in fresh preparations. Two vacuoles, one at either pole of equal size are present in the spore. Spores stained with Giemsa after an initial hydrolysis with IN-HCL for ten minutes revealed the cytoplasm in the form of a faintly stained coiled filament lying within the spore but all attempts to release the polar filaments were unsuccessful. Spores stained according to the PAS technique revealed the presence of a PAS positive polar cap at the anterior end.
The systematic position and the host-parasite relations are discussed.

o

Tuzetia, nouveau genre créé pour des Microsporidies à pansporoblaste monosporé. J.MAURAND, A.FIZE, B.FENWICK et R.MICHEL, Laboratoire de Zoologie, Université des Sciences, 34-Montpellier, France.

Présentation de trois espèces. Schizontes et plasmode sporogoniaux sont classiques. Lors de la sporoblastogenèse, la membrane pansporoblastique accompagne le découpage du plasmode et forme un sac autour de chaque sporoblaste néoformé. Il persiste autour de la spore mûre. Chez l'une des trois espèces, la paroi sporale se double d'une enveloppe surnuméraire complexe.
Tuzetia se distingue de Nosema par la présence d'un pansporoblaste seulement décelable en microscopie électronique et doit être rapproché des Microsporidies à pansporoblaste polysporé (exemple: Thelohania).

o

Continuous propagation of a microsporidian in a cell line established from Malacosoma disstria hemocytes. S.S.SOHI, Department of Fisheries and Forestry, Insect Pathology Research Institute, P.O.Box 490, Sault Ste Marie, Ontario, Canada.

Hemocyte cultures of Malacosoma disstria were started on 15 September, 1969. The M.disstria larvae that were used as the original source of hemocytes were naturally infected with the microsporidian, Glugea disstriae. The microsporidian grew in the hemocyte cultures, and the infection still persists in the cells which are now in the 47th passage over a period of 19 months. Despite this persistent infection the cultures are not completely destroyed by the microsporidian. The proportion of infected cells varies from time to time; once in a while a very large proportion of cells packed with the microsporidian is seen and at other times only an occasional infected cell is encountered. The reason for this fluctuation is not known.
This work demonstrates for the first time the propagation of an insect microsporidian in an established insect cell line.

o

Development of Glugea disstriae in long term ovarian tissue cultures of Malacosoma disstria. S.S.SOHI and GARY G.WILSON, Department of Fisheries and Forestry, Insect Pathology Research Institute, P.O.Box 490, Sault Ste Marie, Ontario, Canada.

Minced ovaries of Malacosoma disstria larvae were explanted in vitro on 21 July, 1969. The larvae, from which these ovaries were obtained, were naturally infected with the microsporidian, Glugea disstriae. The microsporidian grew as the tissue cultures started to grow, and the cells are still infected after 6th subculture in over 20 months. Light microscope examination of cultures fixed with absolute methyl alcohol and stained with Giemsa revealed the various developmental stages, including the infective vegetative form and spores, of G.disstriae in the host cells.

o

Origine et formation du filament polaire chez la microsporidie Nosema vivieri (V.D. et P., 1970). D.VINCKIER, Laboratoire de Protistologie et Microscopie électronique, Département de Biologie, Université des Sciences et Technique de Lille 1, France.

L'étude ultrastructurale du développement de Nosema vivieri a permis de suivre la formation du filament polaire au cours de la sporogonie. Un groupe de vésicules à contenu légèrement opaque aux électrons, situé près du noyau et assimilable à un appareil de Golgi peut être observé dans les jeunes sporoblastes. Ces vésicules paraissent être à l'origine du filament polaire.

Une vacuole à contenu clair semblant provenir de la coalescence de vésicules golgiennes se différencie d'abord puis dans cette vacuole apparaît, au contact du Golgi, une zone plus dense qui serait à l'origine du sac polaire où s'insera le filament. Ce dernier sembles se former par coalescence de petites vésicules qui se disposent en manchon d'allure cylindrique englobant la zone centrale dense du filament. Celui-ci, s'insérant sur le sac polaire qui va prendre la forme d'une ancre, présente 3 zones concentriques. Puis le polaroplaste se différencie; il est constitué de 2 parties: le polaroplaste lamellaire et le polaroplaste vésiculeux. En même temps apparaît dans le sporoblaste, au pôle opposé au sac polaire, la "vacude postérieure" qui semble morcelée, mais deviendra unique dans la spore; la membrane plasmique du sporoblaste d'épaissit alors: elle constituera la paroi définitive de la spore.

o

Observations sur la position systématique des Metchnikovellidae. E.VIVIER. Laboratoire de Protistologie et Microscopie électronique, Université des Sciences et Technique de Lille I, France.

Les Metchnikovellidae constituent une famille de parasites des Grégarines, créé par CAULLERY et MESNIL (1919) et dont la position systématique est restée longtemps incertaine. Rapprochée autrefois des Champignons ou des Haplosporidies, les études récentes en microscopie électronique ont montré des points de ressemblance frappante avec les Microsporidies, aussi bien en ce qui concerne les formes végétatives que les spores.
Ces points sont essentiellement les suivants:

1. pour les stades végétatifs:
   - formes plasmodiales intracellulaires d'abord uinucléées puis plurinucléées.
   - cytoplasme essentiellement constitué de ribosomes et reticulum endoplasmique (granulaire ou non).
   - absence de mitochondries.
   - absence de dictyosomes typiques mais existence d'un appareil golgien primitif.

2. pour les stades reproducteurs:
   - formation des spores directement à partir des stades végétatifs par isolement des noyaux et fragmentation du cytoplasme.
   - Morphologie des spores avec paroi, corps polaire, manubrium à structure de filament polaire, noyau unique.

Ainsi les Metchnikovellidae sont bien apparentées morphologiquement et biologiquement aux Microsporidies et doivent être incluses dans ce groupe. Mais alles montrent des caractères nettement originaux qui portent plus particulièrement sur la spore. Ce sont les suivants:

- Absence, dans l'état actuel des connaissance, d'un long filament polaire enroulé à l'intérieur de la spore;
- Présence, à l'extrêmité distale du manubrium, d'un gland renflé et d'une lame polaire en partie étalée le long de la membrane cytoplasmique et se recourbant vers l'intérieur en forme d'entonnoir.

En conséquence, les Metchnikovellidae ne s'incorporent vraiment dans aucun des groupes existant à l'intérieur des Microsporidies et elles méritent qu'on leur assigne une place à part.

o

Host specificity and host range as symptoms used in microsporidian taxonomy. JAROSLAV WEISER, Laboratory of Insect Pathology, CSAV, Flemingovo nám. 2, Praha 6, Czechoslovakia.

Lack of morphological features in microsporidian spores which may enable species differenciation is compensated to some point by using auxiliary symptoms such as stability of spore size and shape, stability of development, of hosts and infected tissues and of positive transfers. Experience shows in several cases the dangers in general acceptance of these presumptions.
In a series of Thelohania in mosquitoes it was demonstrated that the well known cycle of development in larval mosquitoes alternates in adult mosquitoes with another cycle which is typical for the genus Nosema or Stempellia. Their spores differ in size and shape, in pasporoblast formation, localization in host tissues. There is different type of development in different host sexes and there is no positive direct transfer of the infection from host to host.
In Plistophora culicis and P. culisetae which are identical, there is no direct transmission in Culex and Culiseta , no cross transmission, there is some difference in spore size and in localization in host tissues. Identity of both is established only by identical infections which they produce in Anopheles mosquitoes.
On the other side most microsporidia of plant pests have several hosts which may or may not be from the same food chain or ecological niche. Nosema mesnili is identical with five other species in different hosts and is distributed among this group with infected food or on ovipositors of parasites. Due to this fact, it is most difficult to differentiate a new species without a large testing of cross infectivity. For this testing only living spores are useful and all old descriptions are dubious in cases where spores of identical size and shape are present in identical tissues of hosts which may come into contact for positive transmission.

o

Influence of different hosts on microsporidian morphology, JAROSLAV WEISER, Laboratory of Insect Pathology, CSAV, Flemingovo nám. 2, Praha 6, Czechoslovakia.

Cyst formation around infected cells is the main reaction of vertebrate hosts, it is dependant of iritating substances of the parasite. It does not occur in evertebrates. Phagocytosis results in destruction of spores when in vertebrates, but produces viable spores in lymphocytes in invertebrates. In some cases lymphocytes are the only seat of the infection.
Blackening, melanization of spores is a reaction of insects to circulating spores in the hemolymph. Under surface cover of polyphenols the spores swel to double the original size and degenerate. Only spores which did not reache the shelter of recipient tissues are melanized.
Inadequate environment of the host provocates formation of teratospores, two to threefold the mass of normal spores. Their amount is variable from host to host. In other cases anomalous pansporoblasts are produced with only part of sporoblasts developing spores and partially remaining as degenerative nuclei and plasmatic masses beside mature spores.

o

The ultrastructure of Encephalitozoon cuniculi (Microsporida, Nosematidae) and its taxonomic significance. VICTOR SPRAGUE (1) and SANFORD H.VERNICK (2), University of Maryland, Natural Resources Institute, Chesapeake Biological Laboratory, Solomons, Maryland 20688, U.S.A. (1) and C.W.Post College, Long Island University, Geenvale. New York 11548, U.S.A. (2).

This study augments our knowledge of several ultrastructural features of Encephalitozoon cuniculi and provides evidence that this species is disporous. The authors support Cali's view that Encephalitozoon is distinct from Nosema and should be treated as a valid genus. They compare these with 2 other disporous genera, Glugea and Perezia, and conclude that Glugea is also distinct but Perezia is a junior synonym of Nosema.

ELECTION OF OUR PRESIDENT AT THE ACADEMY OF SCIENCES OF FRANCE.

We are very pleased to announce the recent election of Professor Vago as a member of the Academy of Sciences of France. We present to our President our congratulations for this very high distinction which is also a great honor for our Society.

RESULTS OF VOTE OF OCTOBER, 1970

Dr. J.Richard Weissenberg has been elected as an Honorary Member of the Society. The majority of the members were in favor of a reaffiliation of the Society with the American Institute of Biological Sciences (A.I.B.S.) and were in favor of an increase of the dues of U.S. $ 1.00 per year for North American members only in order to cover the costs of the Society membership in the A.I.B.S..

o

EDWARD A.STEINHAUS MEMORIAL FUND

The former secretary-treasurer of our Society, Dr. H.E.Welch, received from the University of California at Irvine Foundation the following letter:

Dear Mr. Welch,

On behalf of the UCI Foundation, it is my pleasure to acknowledge receipt of your gift to the Edward A.Steinhaus Memorial Fund in the amount of $ 276.94.

We certainly share your feeling of the great loss felt by everyone with the passing of Dr. Steinhaus. He was a dedicated man and contributed so much to so many. The way in which the donations have flooded in to build this memorial fund in his honor has been gratifying to his family, as well as the University.

Please accept our sincerests thanks for your generous contribution, and you can be assured that the funds will be awarded in the manner you desire.

With very best regards and deep appreciation.

Cordially,

John D.Spear, Director
Development and Alumni.

o

MEETINGS

The 3rd International Colloquium on Invertebrate Tissue Culture will be held from 22-25 June 1971 in Bratislava, Czechoslovakia and not from June 18th to 22nd as announced in the Newsletter of February 10, 1971.

The first International Mycological Congress will be held at Exeter (Devon, England) from 7-16 September 1971. The membership fee, which covers participation in all general Congress activities and all publications, is £ 10,-. Students and wives or husbands accompanying Congress members will pay a reduced fee of £ 3,-.

The working group on Lymantria dispar of the Organisation Internationale de Lutte Biologique will meet in Beograd, Yugoslavia on September 9-12, 1971. At this meeting, results will be reported of work on the biological control of this pest insect. The members of the working party will also discuss procedures to be followed for future research on biological control of Lymantria dispar.

o

REGISTRATION OF NUCLEAR POLYHEDROSIS VIRUS OF HELIOTHIS ZEA.

In the last issue of the SIP Newsletter (vol. 3, no.2) was announced that a temporary exemption from requirement of a tolerance was given to the International Minerals and Chemical Corporation at Libertyville, Illinois for residues of the nuclear polyhedrosis virus of Heliothis zea. However, a temporary examption from the requirement of a tolerance was simultaneously given to Nutrilite Products Inc., Lakeview, California for their virus preparation of Heliothis. This fact was unfortunately overlooked by us.We apologize for this error. We can fully understand the effect an oversight like this may have on a research staff that has worked over seven years to secure this registration.

WORLD HEALTH ORGANIZATION

International Reference Center for the Diagnosis of Diseases of Vectors.
by J.D.Briggs.

The Invertebrate Pathology Laboratory associated with the Faculty of Entomology, College of Biological Sciences at the Ohio State University, was designated in 1964 as the International Reference Center (IRC) for Diagnosis of Diseases of Vectors by the World Health Organization. The IRC serves in the educational mission of the University and the humanitarian activities of the World Health Organization by providing a focal point for predoctoral and postdoctoral research and research of visiting scholars. The Center regularly receives assessions of parasitized and diseased vectors from field collaborators throughout the world; and upon preliminary diagnosis of the pathology, refers them to collaborating specialists for specific identification and further study.

In 1969 the activity of the IRC was broadened in its scope. An expedition was undertaken in April, 1969 to the Filariasis Research Unit at Rangoon, Burma (FRU) in order to examine intensively populations of Culex pipiens fatigans for insect pathogens. Procedures were developed in cooperation with FRU personnel for preliminary processing of host specimens to detect pathogens with the aid of light and electron microscopy. Examination of specimens was conducted at FRU and the IRC following regular air mail shipments. The emphasis on detection of all pathogens affecting a particular vector, by close cooperation with the Filariasis Research Unit, was a logical and important development of the intensive survey for Coelomyces infections in C.p. fatigans initiated in late 1968. It is evident that many benefits were derived from the principle and practice of the expanded activity of the IRC; field experience for the center personnel and the collaborating specialists identified with the IRC, the onsite training of resident personnel at a research unit, and the regognition of opportunities to initiate screening programs and pilot field studies with candidate pathogens.

The IRC will continue to increase in efficiency for diagnoses, training, and educational purposes as the reference collection of identified hosts and pathogens and associated bibliographic collection develops as a working resource for scientists. In addition to those specimens submitted for diagnosis and subsequently identified by specialists, the IRC will receive specifically identified infected/parasitized host specimens, unprocessed identified pathogens, or paratype specimens of pathogens.

Specimens were received at the IRC in 1969 appropriately preserved or chemically fixed for histological preparations. The total number of individual specimens accesssioned for examination and referral by the IRC in 1969 was approximately 4,100.

(Partially reprinted from document WHO/VBC/70.250 with permission of World Health Organization).

LETTERS TO THE EDITOR

Sir,

The issue of the SIP Newsletter of September 21, 1970 included the ballot and the bibliography of a distinguished protozoologist and fish pathologist Dr. R.Weissenberg in connection with his proposed election as a honorary member of the Society of Invertebrate Pathology. Along with pertinent information on Dr. Weissenberg's scientific career, this circular included a few lines of a very controversial character: ".... if invertebrate pathologists are to be prevented from perpetuating chaos in microsporian taxonomy by treating Glugea as junior synonym of either Perezia as Weiser proposed in 1961 or Nosema - as Lom and Weiser proposed in 1969 - it will be due to the persistent effort of Dr. Weissenberg".

This statement is far from reflecting the real situation. The published proposals to synonymize the mentioned genera were motivated merely by the intention to bring up to date the taxonomic situation of these microsporidia. The definition of the genera Nosema, Glugea and Perezia were given a long time ago and their status did not correspond to the present state of knowledge. The generic names of Nosema and Glugea were used alternately for the same microsporidia till 1900. Kudo based his taxonomy, which is still valid, on the definition "how many spores are formed from one sporont". Our amendments were based on his definitions, on the definition of the cyst as the product of the host / Weissenberg's xenoma / and on the known disporal sporogony of the type species of the genus Nosema, N. bombycis. We believe we have sufficiently documented our ideas in our papers and thus far we know of no fresh facts disproving them.
We believe that the statement mentioned above is neither the unanimously expressed opinion of the officers of the SIP nor that of the members of the Division on Microsporidia, but more probably, though unsigned, an individual personal opinion. It is quite natural that some microsporidiologists will dislike the idea proposed in our paper and regard it as "... perpetuation of chaos". However, we feel that such strongly biased statement would find its proper place in signed scientific discussions or papers, based on new facts. An official document should not be misused for personal anathema of nonconform scientific views. This does a personal injustice to Dr.Weissenberg, whose scientific merits need not to be stressed by depreciation of other authors. We do not regard this approach as the right way for further cultivation of the friendly atmosphere existing among the members of the Society of Invertebrate Pathology.

J.Weiser

J.Lom

Sir,

Drs. J.Weiser and J.Lom raised a question about a controversial statement that occured in the biography of Dr. R.Weissenberg.
As the Society officer rrsponsible for the distribution of this statement (Newsletter 3 (1): top of page 4), I would hasten to explain that this statement is not my opinion nor the expressed opinion of the officers of the Society, but rather a statement prepared by the nominators of Dr. R.Weissenberg for "Honorary Membership".

The Statement was sent to my office. I was absent at the time of its receipt, but I left instructions that it should be duplicated and distributed with the Newsletter as soon as possible. I now sincerely regret that I was absent, for I might have noticed this statement and requested a re-write of the biography.
I express my hope and that of the Executive that the statement will not reflect in any way on the nomination of Dr. R.Weissenberg, nor discourage friendly relations among members. All scientists accept that differences of opinions may develop among colleagues, but all should strive to develop understanding and co-operation in the resolution of their differences.

Yours sincerely,

H.E.Welch

Sir,

We, the undersigned, support the nomination of Dr.Weissenberg for honorary membership in S.I.P. We, however, regognized a great personal dismay upon reading the second paragraph of the vita, enclosed in the September Newsletter, finding that it contains a statement which inadvertently offended two other prominent microsporidian researchers.

It is unfortunate that the vita was accepted for publication without close review by the author(s) or editors.
The problem is further compounded by the fact that the Society at large has erroneously assumed, since the author(s) of the vita was not cited, the Microsporidian Division endorsed it. The Division has received letters from members of the Society to this effect.

As representatives of the Microsporidian Division, we wish to apologize to our colleagues who were unnecessarily offended, and to suggest a development of procedures for internal review of Society documents for public distribution.

Sincerely,

(signed) Jiri Vavra, Roy E.Maclaughlin,
Ann Cali, one signature illegible,
Officers of the Microsporidian Division.

We propose that the discussion on this subject is ended.

In name of the Council

C.Vago
P.A.van der Laan

NEW BOOKS

A new book entitled "The Cytoplasmic-Polyhedrosis Virus of the Silkworm" and edited by H.Aruga and Y.Tanada, has been published by the University of Tokyo Press, Bunkyo-ku, Tokyo, Japan at the end of April 1971. The book contains 224 pages and has the following chapters:

1. H.Aruga: Cytoplasmic Polyhedrosis of the Silkworm-Historical, Economical and Epizootiological Aspects.
2. K.Aizawa: Structure of Polyhedra and Virus Particles of the Cytoplasmic Polyhedrosis.
3. S.Kawase: Chemical Nature of the Cytoplasmic-Polyhedrosis Virus.
4. T.Hukuhara: Variations in Cytoplasmic-Polyhedrosis Virus.
5. Y.Iwashita: Histopathology of Cytoplasmic Polyhedrosis.
6. M.Kobayashi: Replication Cycle of Cytoplasmic-Polyhedrosis Virus as observed with the Electron Microscope.
7. S.Miyajima and S.Kawase: Multiplication of the Cytoplasmic-Polyhedrosis Virus.
8. H.Watanabe: Pathophysiology and Cytoplasmic Polyhedrosis in the Silkworm.
9. H.Watanabe: Resistance of the Silkworm to Cytoplasmic-Polyhedrosis Virus.
10. Y.Tanada: Interactions of Insect Viruses, with Special Emphasis on Interference.
11. S.Tanaka: Cross Transmission of Cytoplasmic-Polyhedrosis Viruses.

Appendix

1. List of Insects Reported to Have Cytoplasmic Polyhedrosis.
2. Bibliography of Cytoplasmic Polyhedrosis of Insects.

The new book "Microbial Control of Insects and Mites", edited by H.D.Burges and N.W.Hussey is now available at the bookstore.
The publisher is Academic Press and the price is £ 11,50.

GLOSSARY OF TERMS USED IN INVERTEBRATE PATHOLOGY

The second revised edition of An Abridged Glossary of Terms Used in Invertebrate Pathology, by the late Edward A.Steinhaus and by Mauro E.Martignoni, is now available for distribution. This Glossary lists selected words and terms commonly appearing in the literature of invertebrate pathology. Some of the terms are unique to invertebrate (especially insect) pathology. Others are common throughout all areas of pathology but their special meaning and relevance in invertebrate pathology are highlighted. A particularly noteworthy innovation, in this second edition, is the listing of over 100 maladies of insects and other invertebrates. Copies of the 38-page Glossary may be obtained free of charge from Dr.Mauro E.Martignoni, Forestry Sciences Laboratory, P.O.Box 887, Corvallis, Oregon, 97330, U.S.A.

COURSE ON PATHOLOGY AND DISEASE IN MARINE ANIMALS

The Santa Catalina Marine Biological Laboratory is pleased to announce the offering of:

PATHOLOGY AND DISEASE IN MARINE ANIMALS

(June 16 - July 20, 1971)

A general course on the disorders of invertebrate and vertebrate marine animals. Topics will include inflammation, wound healing, tumor formation, defense mechanisms, and various disease entities.

Course Instructors: Dr.Albert Smith , University of Hawaii, Hilo Campus
Dr.Ronald Taylor, California State College at San Bernardino.

For additional information write to Dr.Russel L.Zimmer, Santa Cataline Marine Biological Laboratory, Box 398, Avalon, California 90704 or telephone area code 213, Avalon 811 (operator's assistance is required).

Other summer courses to be offered at the laboratory include BIOLOGY OF MOLLUSCA (June 16-July 20) and POLLUTION AND ENVIRONMENT (July 22-August 25). Abundant research opportunities are available..

NEW ADDRESSES.

Hisao Aruga, Department of Sericulture, Faculty of Agriculture, Tokyo Noko University, Saiwai-Cho, Fuchu-shi, Tokyo, Japan.

Richard C.Berberet, 4129 Holdrege, Apartment 2, Lincoln, Nebraska 68503, U.S.A.

H.D.Burges, Glasshouse Crops Research Institute, Worthing Road, Rustington, Littlehampton, Sussex, U.K. (after July 12).

Burdett Warren Erickson, Jr., Department of Zoology, Silvester Hall, University of Maryland, College Park, Maryland 20742, U.S.A.

Dr. Carlo M.Ignoffo, Biological Control of Insects Laboratory, USDA-ARS-ERD, Box A, Columbia, Missouri 65201, U.S.A.

Dr. G.O.Poinar, Laboratorium voor Toegepaste Entomologie, Linnaeusstraat 2 B, Amsterdam-O, the Netherlands (until October 1971).

Dr.Lalitha Raghunathan, Apartment A, 237 West Laurel, San Diego, California 92101, U.S.A.

POSITION WANTED

Dr. (Mrs.) Lalitha Ragunathan, 237 W.Laurel, Apt. "A", San Diego, California 92101, U.S.A.

Desires a teaching and/or research position in any branch of Protozoology or Parasitology in a research institute or at a university in the United States.

B.Sc. (1960): from R.B.V.R.R. college for women, Osmania University, Hyderabad, India.

M.Sc. (1962): in Zoology (Helminthology).

Ph.D. (1968): in Protozoology. Dissertation: "Studies on Parasitic Protozoa (Myxosporidia) of fresh water fishes of Andhra Pradesh, India."

Curriculum vitae available.

NEWSLETTER CORRESPONDENTS

Please send news items directly to the Editor, L.P.S.van der Geest, Laboratorium voor toegepaste Entomologie, Linnaeusstraat 2 B, Amsterdam, the Netherlands, or to the regional correspondents listed below.

EUROPE

AUSTRIA:
- E.Jahn, Forstliche Bundesversuchsanstalt Schönbrunn, Vienna XIII.

BULGARIA:
- R.Grigorova, Institute of Microbiology, KV Geo Miley, Sofia 13.

CZECHOSLOVAKIA:
- O.Lysenko, Insect Pathology, Institute of Entomology, CSAV, Flemingovo n.2, Praha 6.

FRANCE:
- B.Hurpin, Station de Recherche de Lutte Biologique et Biocoenotique, Le Minière - 78 - Versailles.
- C.Vago, Faculté des Sciences, 34-Montpellier.

GERMANY:
- J.M.Franz, Kranicjsteinerstrasse 81, 61 Darmstadt, W.Germany.

GREECE:
- Ch.Yamvrias, Benaki Phytopathological Institute, Kiphissia, Athens.

ITALY:
- A.Magnoler, Statione Sperimentale del Sughero, 07029 Tempio Pausania, Sassari.

POLAND:
- J.J.Lipa, Laboratory of Biological Control, Institute of Plant Protection, Grunwaldzka 189, Poznan.

PORTUGAL:
- F.Heitor, Estacao Agronomica Nacional, Oeiras.

SCANDINAVIA:
- R.Charpentier, Zoological Institute, Lund, Sweden.

SPAIN:
- F.Jiminez-Millan, Catedra de Zoologia, Facultad de Ciencias, Universidad de Granada, Granada.

SWITZERLAND:
- G.A.Benz, Dept. of Entomology, Swiss Federal Institute of Technology, Universitätsstrasse 2, Zürich CH 8006.

UNITED KINGDOM:
- W.A.L.David, University Farm Road, Huntingdon Road, Cambridge, CB50DJ.
- H.D.Burges, Pest Infestation Laboratory, London Road, Slough, Bucks (for new address, see page 31).

U.S.S.R.:
- V.P.Pristawko, Institute for Plant Protection, Vasil Kowskaia 51, Kiev 127.

YUGOSLAVIA:
- L.Vasiljevic, Institute of Plant Protection, Lab. of Biological Control, Bunatska 33, Zemun.

ASIA

CHINA
- David F.Yen, Laboratory of Entomology, Dept. of Plant Pathology and Entomology, College of Agriculture, National Taiwan University, Taipei, Taiwan.

INDIA:
- S.V.Amonkar, Bhabka Atomic Research Centre, Modular Laboratories, Trombay, Bombay-74.
- C.C.Narasimhamurti, Department of Zoology, Andhura University, Waltair.

IRAN:
- P.Aziz Kharazi, Faculty of Agriculture, Lab. of Entomology, Kharadj.

ISRAEL:
- I.Harpaz, Hebrew University of Jerusalem, Faculty of Agriculture, P.O.Box 12, Rehovot.

JAPAN:
- K.Aizawa, Institute of Biological Control, Faculty of Agriculture, Kyushu University, Fukuoka.
- H.Watanabe, Laboratory of Sericulture, University of Tokyo, Bunkyo-ku, Tokyo.

- PHILIPPINES:
B.P.Gabriel, Department of Entomology, College, Laguna.

S.E.ASIA

- S.Praserthpon, Entomology Section, Department of Agriculture, Bangkhen, Bangkok, Thailand 9.

AFRICA

- A.M.Afify, Biological Control Unit, National Research Center, Dokki, Cairo, Egypt.
- T.V.Vankatraman, Faculty of Agriculture, University of Khartoum, P.O.Box 32, Khartoum North, Sudan.

AUSTRALIA AND NEW ZEALAND

- C.S.Simmons, Animal Research Institute, Yeerong Pilley, Queensland 4105.

AMERICA

CANADA:
- T.A.Angus, Insect Pathology Research Institute, P.O.Box 490, Sault Ste Marie, Ontario.
- G.E.Bucher, Research Institute, Canada Department of Agriculture, P.O.Box 367, Belleville, Ontario.
- J.S.Chadwick, Department of Microbiology, Queen's University, Kingston, Ontario.
- M.Laird, Department of Biology, Memorial University of Newfoundland, St.John's Newfoundland.
- W.A.Smirnoff, Forest Research Laboratory, Department of Forestry, P.O.Box 35, Sillery, Quebec.
- H.E.Welch, Department of Zoology, University of Manitoba, Winnipeg, Manitoba (presently on sabbatical leave).

UNITED STATES:

-G.E.Allen, Department of Biological Sciences, Florida Technological University, Orlando, Florida 32801. For: Florida and Georgia.
-M.A.Brooks, Department of Entomology, Fisheries and Wilflife, University of Minnesota, St.Paul, Minnesota 55101. For: Minnesota, North Dakota and South Dakota.
-W.M.Brooks, Department of Entomology, Box 5215, North Carolina State University, Raleigh, North Carolina 27607. For: North Carolina, South Carolina, Mississippi and Alabama.
-T.C.Cheng, Department of Biology, College of arts of Science, Lehigh University, Bethlehem, Pennsylvania 18015. For: Pennsylvania and West Virginia.
-H.T.Dulmage, U.S.D.A., A.R.S., P.O.Box 1033, Brownsville, Texas 78520. For: Arkansas, Oklahoma, Louisiana, New Mexico and Texas.
-R.H.Goodwin, Insect Pathology Pioneering Laboratory, Building A, A.R.S., U.S.D.A., Beltsville, Maryland 20705. For: Maryland, Delaware, Washington D.C. and Virginia.
-R.R.Granados, Boyce Thompson Institute for Plant Research, 1086 North Broadway, Yonkers, New York 10701. For: Connecticut, New Jersey, New York, Maine and Rhode Island.
-C.M.Ignoffo, Biological Control of Insects Laboratory, U.S.D.A.-A.R.S.-E.R.D., Box A, Columbia, Missouri 65201. For: Missouri, Kansas, Nebraska and Tennessee.
-J.P.Kramer, Department of Entomology and Limnology, Comstock Hall, Cornell University, Ithaca, New York 14850. For: Massachusetts, New Hampshire, New York and Vermont.
-J.V.Maddox, Section of Economic Entomology, Illinois Natural History Survey, Urbana, Illinois 61801. For: Illinois, Iowa and Wisconsin.
-M.E.Martignoni, Forestry Sciences Laboratory, P.O.Box 887, Corvallis, Oregon 97330. For: Idaho, Oregon and Wyoming.
-A.R.Mead, Department of Zoology, University of Arizona, Tucson, Arizona 85721. For: Arizona, Colorado and Utah.
-J.D.Paschke, Department of Entomology, Purdue University, West Lafayette, Indiana 47907. For: Indiana and Kentucky.
-E.L.Reeves, Divison of Biological Control, University of California, Department of Entomology, Riverside, California 92502. For: Southern California.
-A.K.Sparks, College of Fisheries, University of Washington, Seattle 98105. For: Alaska, Montana and Washington.
-G.R.Stairs, Faculty of Entomology, The Ohio State University, 1735 Neil Avenue, Columbus, Ohio 43210. For: Michigan and Ohio.
-M.Tamashiro, Department of Entomology, University of Hawaii, Honolulu, Hawaii 96822. For: Hawaii.
-Y.Tanada, Department of Entomology and Parasitology, University of California, Berkeley, California 94720. For: Northern California and Nevada.
-W.G.Yendoll, Department of Entomology, Pesticide Laboratory, Pennsylvania State University, University Park, Pennsylvania 16801. For: Pennsylvania.

CENTRAL AMERICA

-G.Kuno, Entomological Pioneering Laboratory, Mayaguez Campus, University of Puerto Rico, Mayaguez, Puerto Rico.

SOUTH AMERICA

-P.Laison, Welcome Parasitology Unit, Caixa Postal 232, Belem-para, Brasil.
-E.C.Mateo, Universidad Nacional Fed. Villerreal, Francia 726, Miraflores, Lima, Peru.

BIOLOGICAL CONTROL OF VECTORS

A report of the symposium on the biological control of vectors, held on August 25, 1970 at the 4th international colloquium on insect pathology in College Park, Maryland, U.S.A. has recently been published in Science. Reprints of this article which has been written by Dr.Marshall Laird can be obtained through the Secretary Dr.P.A.van der Laan, Laboratorium voor Toegepaste Entomologie, Linnaeusstraat 2 B, Amsterdam-O, the Netherlands.

NEW MEMBERS

Regular members:

Dr.Marion Bakula, Department of Biology, Saint Louis University, 1504 South Grand Boulevard, Saint Louis, Missouri 63108, U.S.A.

Noël Boemare, Laboratoire de Pathologie Comparée, Université des Sciences, 34-Montpellier, France.

Jean-Robert Bonami, Laboratoire de Pathologie Comparée, Université des Sciences, 34-Montpellier, France.

Howard A.Chittick, Box 129, Clinton Corners, New York 12514, U.S.A.

Dr.George Cline, Department of Biology, University of Alabama at Birmingham, 1919 South Seventh Avenue, Birmingham, Alabama 35233, U.S.A.

Dr.Guy Croizier, Station de Recherches Cytopathologiques, 30-Saint-Christol-les Alès, France.

Dr.Michael Detri, Institute of Pathological Anatomy, University of Copenhagen, 11 Frederik den Femtes Vej, 2100 Copenhagen, Denmark.

Walter Rudd Douglas, Department of Zoology, Rutgers University, New Brunswick, New Jersey 08903, U.S.A.

Torgeir Edland, Norwegian Plant Protection Institute, Division of Entomology, Statens Plantevern, 1432 Vollebekk, Norway.

Dr.Erik Heegard, Abbott Laboratories, Scientific Division, P.O.Box 21C, 53A High Street, Esher, Surrey, England.

Jules A.Hoffmann, Laboratoire de Biologie, 12 Rue de l'Université, 67-Strassbourg, France.

Dr.Pierre Jolivet, 67 Boulevard Soult, 75-Paris 12, France.

David Christopher Kelly, Unit of Invertebrate Pathology, Department of Forestry, Oxford University, South Park Road, Oxford, U.K.

Dr.Robert G.Kenneth, Department of Plant Pathology and Microbiology Faculty of Agriculture, Hebrew University of Jerusalem, P.O.Box 12, Rehovot, Israel.

Ronny Larsson, Zoologiska Institutionen, Entomologiska avdelningen, Helgonavagen 3, 223 62 Lund, Sweden.

Claude Louis, Station de Recherches Cytopathologiques, 30-Saint-Christol-les-Alès, France.

Dr.Logan M.Mahaffey, Brattleboro Memorial Hospital, 9 Belmont Avenue, Brattleboro, Vermont 05301, U.S.A.

Jean Maurand, Laboratoire de Zoologie, Université des Sciences, 34-Montpellier, France.

Dr.Gert B.Orlob, Department of Botany, University of Toronto, Toronto 5, Ontario, Canada.

Dr.John E.Scanlon, University of Texas at Houston, School of public Health, P.O.Box 20186, Astrodome Station, Houston, Texas 77025, U.S.A.

Jean Claude Veyrunes, Station de Recherches Cytopathologiques, 30-Saint-Christol-les-Alès, France.

Evgenia Videnova, Plant Protection Institute, Sofia, Kostinbrod, Bulgaria.

Prof.E.Vivier, Laboratoire de Biologie animale, Université des Sciences et Techniques de Lille I, B.P. 36, 59-Villeneuve d'Ascq, France.

Dr. E.U.Wilson, Entomology Section, Imperial College Field Station, Ascot, Berkshire, England.

STUDENT MEMBERS

Mohammed Adel El Ftaïeh, Laboratoire de Pathologie Comparée, Université des Sciences, 34-Montpellier, France.

Josette Durand, Laboratoire de Pathologie Comparée, Université des Sciences, 34-Montpellier, France.

Jean-Paul Latgé, Laboratoire de Pathologie Végétale, E.N.S.A.T., 145 Avenue de Muret, 31-Toulouse, France.

Richard S.LeGore, College of Fisheries, University of Washington, Seattle, Washington 98105, U.S.A.

Elie Mechelany, Laboratoire de Pathologie Comparée, Université des Sciences, 34-Montpellier, France.

Gilles Morel, Laboratoire de Pathologie Comparée, Université des Sciences, 34-Montpellier, France.

Alizadeh Safar, Laboratoire de Pathologie Comparé, Université des Sciences, 34-Montpellier, France.

Bruno Trumpi, Mikrobiologisches Institut der E.T.H., Universitätsstrasse 2, 8006 Zürich, Switzerland.

Amsterdam, June 1971.

Dear Correspondent,

The enclosed issue of the S.I.P. Newsletter contains a list of Society members who are willing to act as correspondents in order to aid me in my task as editor. I have assigned to all correspondents a specific geographic region. I expect that this set up will facilitate the work of the correspondents greatly and will make it also more efficient.

A part of the next issue of the Newsletter will be reserved for reports of the Annual Meeting of the Society to be held this year in Montpellier. I would like to add also some other articles to this issue. Points to be considered are for example:

1. Reports of past meetings, congresses, etc.
2. Coming events (meetings etc.)
3. News from Universities (new degrees, new research projects)
4. New books related to invertebrate pathology
5. If someone is working under coditions that are different from those under which most people work, he could probably be asked to write a short evaluation of his work. See e.g. the report of Mr Couch in the Newsletter of last February. Also, people working in tropical countries under often primitive circumstances could be asked for a short article.

I hope that you may help me again to "fill" the next issue of our periodical. Several correspondents sent me news items for the previous issue. My personal opinion is that the Newsletter should contain as varied news as possible. Your assistance in this work will be necessary.

Yours sincerely,

Leo van der Geest
Editor S.I.P. Newsletter
Laboratorium voor Toegepaste Entomologie
Linnaeusstraat 2 B
AMSTERDAM - The Netherlands.

ORGANISATION INTERNATIONALE DE
LUTTE BIOLOGIQUE CONTRE LES
ANIMAUX ET LES PLANTES NUISIBLES

INTERNATIONAL ORGANIZATION
FOR BIOLOGICAL CONTROL OF
NOXIOUS ANIMALS AND PLANTS

SYMPOSIUM of the COMMISSION of INSECT PATHOLOGY
and MICROBIAL CONTROL
(O.I.L.B.)

Programm of the session on

Epizootiology and Ecology of Insect Pathogens

Friday morning, June 18, University of Montpellier

9:00 - 9:30	Invited paper	C.E. Gordon Smith
9:30 - 9:45	Discussion	
9:45 - 10:00	A report on the symposium "Pest Control strategies for the future", held in Washington D.C. April 1971	J.D. Briggs
10:00 - 10:15	Discussion	
10:15 - 10:30	Coffee break	
10:30 - 10:45	The mode of transmission of Tipula iridescent virus (T.I.V.)	J.B. Carter
10:45 - 11:00	Virulence de différentes souches de virus de polyédrose de Lymantria dispar pour son hôte	J.L. Vasiljevic et M. Injac
11:00 - 11:15	The effect of different diets on the incidence of granulosis virus disease in Pieris brassicae	W.A.L. David, G. Taylor and S. Ellaby
11:15 - 11:30	Nouvelles perspectives de lutte virale contre Heliothis armigera Hb (Lepidoptera, Noctuidae) ravageur du cotonnier en Afrique	P. Atger
11:30 - 11:45	Comparaison en parcelles de prairies naturelles de l'activité de certains entomopathogènes à l'égard du Hanneton, Melolontha melolontha L.	B. Hurpin et P.H. Robert
11:45 - 12:00	Discussion	