IOBC Newsletter

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IOBC is affiliated to the International Council of Scientific Unions (ICSU) as the Section of Biological Control of the International Union of Biological Sciences (IUBS).

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News from the Secretariat

1. IOBC - Global

1.1 IOBC General Assembly

This will be held during the XVI International Congress of Entomology in Kyoto (3-9 August, 1980). The agenda will be sent to members as soon as the date and place have been settled by Dr. H. Mori (Japan), local organizer of the meeting.

1.2 Postal Ballot for Election of Members of the IOBC Executive Committee

A second ballot has been launched and votes should reach the Secretariat by the end of March 1980. The present members of the Executive Committee have accepted to prolong their mandates up to that time.

1.3 IOBC is Sponsoring the International Symposium on the Ecology of Bruchids Attacking Legumes, Tours (FR), 16-19 April, 1980

Professor J. L. Lebreton of the University Charles Basset, Avenue Monge, 37230 Tours (FR), Tel. (47) 28 12 80, and his team of experts have drawn up the programme, an outline of which is given below:
- Study of general problems concerning bruchids;
- Relation between bruchids and their host plants;
- Importance of polymorphism in different bruchid populations;
- Biogeography, parasitism and distribution of bruchid attacks;
- Establishment of short-term and long-term international programmes.

FAO is collaborating in this meeting which is expected to have a far-reaching impact on alleviating future crop losses through concerted action in the implementation of action programmes in the Third World.

Please contact Professor Lebreton directly (participation fee: 1000 French francs, including board, dinner and proceedings).

Secretary-General: G. MATHYS, 1, rue Le Nègre, FR-75016 Paris (France).
1.4 IBRC is Organizing a Conference on "Constrains to Implementation of Integrated Pest Control" at the Bellosgo Conference Centre of the Rockefeller Foundation (20 May to 4 June, 1980)

The purpose of this meeting which is restricted to invités is to clear up the general introduction of IPC and to study the ways of removing them.

1.5 IBRC International Working Group on Ostracide (IWGO) : see IBRC Newsletter 13-14, 1979)

This Group is meeting in Vienna from 22 to 25 September 1980 under the chairmanship of Professor H.C. Chang (restricted to members).

2. West Palearctic Regional Section (WPERS)

2.1. Obituary—Charles FERRIERE 1888-1979

Dr Charles Ferrière died on 21st March in Geneva after a short illness. He was in his 91st year.

Swiss by birth, Dr Ferrière obtained a science degree in 1910. In 1911 he moved to Great Britain for a year to specialise in entomology, first at the Museum of the University of Cambridge and then at the University of Edinburgh. He obtained diplomas, with distinction, in agricultural entomology and forest entomology. Dr Ferrière received his doctorate in Geneva in 1913 for a thesis on the wood-boring wash-organisms of aquatic hemiptera.

The time which he spent at the Entomological Station in Paris (1913-1914) was decisive for the development of his scientific work which he performed in Berne where, from 1917 to 1927, he acted as keeper of the entomological collections, and then until 1940 at the Commonwealth Institute of Entomology at the British Museum (Natural History) where he was Senior Assistant, specialist in cochlines and botanical entomology.

In 1940, because of the War and family commitments, he returned to Geneva where, in 1941-42, he was temporary assistant at the Natural History Museum. Then, for two years, he was attached to the Federal Station for seeds and field crops at Lausanne and helped in the Colorado beetle control campaign until an opening in 1944 at the Natural History Museum in Geneva allowed him to pursue his taxonomic research again. From 1955, after retirement age, he continued, nonetheless, to work regularly at the Museum, until 1974, to finish his ongoing studies on the cochlines. It was during this period that he contributed a section on Hymenoptera Apocrita to "La Faune de l'Europe" and the "Les Insectes Mediterraneens" published in 1965 by Musée et Conf. Paris.

Dr Ferrière took an active part in efforts leading, in 1950, to the establishment of the International Commission of Biological Control (ICBL), the forerunner of the International Organisation for Biological Control (IOBC). He was soon entrusted, from 1953 to 1958, with the direction of the "Service d'identification des insectes entomophages" of the ICBL, with headquarters in Geneva at the Natural History Museum. It is also of note that, from 1947 to 1952, our colleague was visiting professor at the Faculty of Science at the University of Geneva, for a course in weed entomology.

Dr Ferrière's 150 publications, comprising 1650 pages, bear witness to his prolific activity. Throughout his long career, he received many distinctions. He was successively elected Honorary Member of the Royal Entomological Society of London (1949), of the Entomological Societies of France (1950), Belgium (1950), the Netherlands (1951), Switzerland (1955), Bavaria (1964) and Geneva (1965), and Associate Member of the Zoological Society of London (1955). A bibliographic list of his work for the period 1912-1952 appeared in Volume XXI (1958-1959), pages 349-351 of the "Catalogue des ouvrages, articles et mémoires parus par les professeurs et privés-docents de l'Université de Genève," and for the period 1952-1974, in Volume 31 (1978), pages 297-299 of the Bulletin of the Swiss Entomological Society.

He bequeathed his collection of entomophagous hymenoptera, his library and a large catalogue to the Natural History Museum in Geneva.

Dr Charles Ferrière will be recalled as a modest and affable scholar. IOBC pays tribute to the work which he accomplished over more than half a century, completely devoted to the study of entomophagous species and to the cause of biological control.

Paul BOVEY

2.2 International Symposium on Integrated Control in Agriculture and Forestry, Vienna, 8-11 October, 1979 (organised by the West Palearctic Regional Section of IOBC)

The purpose of this meeting was to evaluate the present state of integrated pest management in a number of advanced European, Mediterranean and Middle Eastern Research and Development Centers in cooperation with WPERS Work Parties. There are currently 23 such Working Parties, many of which are engaged in specific research likely to pave the way for the establishment of integrated pest control. Some other Groups are directly involved in the development of management systems at the crop level, e.g., pastures, grassland, grain crops, corn, Mediterranean pine forests, while another is tackling the problem of long-term control of soil pests. It is worth mentioning that several years ago a Group was established with the aim of securing integrated crop production in orchards.

Professor Kurt Roux of the Austrian Federal Plant Protection Institute secured the local organization at the prestigious Hofburg in an outstanding way and nearly 500 participants from 37 countries were registered. The following major topics were considered by 54 researchers and administrators:

- PAOs views on Integrated Pest Control (IPC) and its potential in protecting the world's food supply;
- Technologies leading to IPC;
- Status of IPC in major crops of the palearctic region.

Connected with the Symposium were 2 workshops on the following two major themes:

- Physical, biological and biochemical technologies of integrated crop protection;
- Integration of crop protection for various crops.

The proceedings of the Symposium are expected to be issued in spring 1980 (contact Prof. K. Roux, Bundesanstalt für Phytopathologie, P. B. 154, A-1221 Vienna 2, Austria). Summaries of main lectures and discussion papers are available.

2

A Sub-group of this body met for the first time in November 1979 to study the 'Sesamia problem.'

In Morocco, where *S. nonagrioides* and *S. cerealis* are present and develop 4-5 generations, mainly on wheat and maize, crop losses may reach 95-100%. The pest also occurs on sorghum, rice, sugar-cane and wild grasses in Africa. In France, south of 44° latitude, *Sesamia nonagrioides* on maize, sorghum and rice. Cold winters are the major regulating factor and also possibly the tachinid *Lecilus aeneus*. Collaborative studies between France, Portugal and Spain are currently being undertaken on maize varieties resistant to *Sesamia nonagrioides*. Attempts are being made to synthesise the phenomenon of *S. nonagrioides*.

The Sub-group proposed to continue on the following research objectives:

1. *Characterisation of populations according to ecological conditions.*
2. *Biological control by means of entomophages.*
3. *Isolation and selection of species of *S. cerealis* and *S. nonagrioides.*
5. *Resistance breeding.*


The members endorsed the concept and format developed by D.I. Bay (East Malling Research Station, Ashford, Kent) for the "Inventory of models useful in the West European Region" to be published as an IOBC/WPRS Bulletin in 1980. Dr. Riere was re-elected to prepare the manuscript for 57 models which will include a summary of meteorological data processing established by Moller (University of Stuttgart-Helldheim).

The Working Group decided to provide advice on modelling for any researchers in integrated pest control. It also encouraged the organisation of a second training course in simulation in crop protection supported mainly by members of the WPRS-Group and conducted under the leadership of Prof. J.Zákala at the Agricultural University at Wageningen (NL), possibly in 1982 with about 20 trainees.

As a first step in the generalization of available models, it was proposed to have a 'CIPRE', the Ceracrona Asia model and the powders model from Giesen offered for use at the Lattenbach farm in Baden-Württemberg where an extended integrated pest management project is currently operated by Dr. H. Steiner (Plant Protection Research Institute, Baden, Stuttgart).

A Sub-group consisting of G.A. Newton (Imperial College, London), P. Webster (Wye College) and J.C. Zákala (Wageningen) agreed to prepare a report on an 'Erecting threshold' in relation to modelling for pest management systems.
Another sub-group is establishing instructions for developing models for practical use in integrated pest management, with emphasis on managerial aspects.

The Group is due to meet in France on the invitation of Dr. Rupley, INRS (Versailles).

2.6 Announcement

2nd EUCARP/IDOC/WPRS Meeting of the Working Group: Breeding for Resistance to Insects and Mites, to be held in Cambridge (UK) from April 9-11, 1980.

Details from Miss J.H. Parker, Conference Secretary, 2nd EUCARP/IDOC Meeting, East Malling Research Station, Kent ME11 6LE GB. (Attention to members.

3. Review of Some Interesting Developments

3.1 Microbial and Integrated Control of Vectors of Medicinal Importance

3.1.1 Us nouveau candidat à la lutte biologique contre les mononuque Bacillus thuringiensis var. israelensis, De Boryst, H. (1975); Eurenphila 23:43-319-319.

Recently, substantial advances have been made with regard to new approaches to biological control as a contribution to integrated methodologies in mosquito control. The potential of these approaches involving Bacillus thuringiensis var. israelensis is to be studied.


The main experiment, conducted in a wildlife reserve, resulted in total mortality of the larvae of the 3 species within 1.5 days after IP application. No adverse effect was observed on other aquatic invertebrates. Since the experiments were successful under difficult conditions, such as low water temperature and heavy vegetation, good results are also expected in moderate and tropical climates.


The second Swiss publication refers to an exhaustive study of mosquito control under practical conditions with BT var. israelensis. The results were very promising.


We describe some flatworms in the genus Monopisthocotyle that kill mosquito larvae and may account for the variability in the population densities of Culex tarsalis and Aedes larvae in rice fields. When mosquito larvae were killed against these worms, the larvae immediately become paralyzed and die. When C. tarsalis larvae are placed inside floating cages that exclude flatworms (150-micrometer mesh), there is a fourfold increase in their survival. Rice fields that have abundant mosquito populations lack flatworms. Most such fields have only recently been turned over to rice production, suggesting that the flatworms have difficulty dispersing to new fields but, once established, are able to overwinter and control mosquitoes for the subsequent years of rice production.


Propagation of Nasonia vitripennis, a parasitic nematode, was investigated by inoculation of spoons into the hemocoel of insects and by growth in three cultures. Loci found in the larva of trematode species were good hosts but cockroaches were not. Less replication was obtained from trematode species after 20 per cent infection. All stages of the microsporidium developed in cell lines of Xenopus laevis and a Xenopus laevis infected with the microsporidium were isolated and used in inoculation to isolate the hemocoel.

3.2 Plant Protection


The author shows how breeding and plant pathology has had a tremendous impact on agriculture in recent years. He also refers to integrated pest control in the following way:

"The integration of several methods of pest and disease control minimizing chemical and maximising biological and agronomic methods has developed fast in recent years, particularly in fruit production and for ornamentals, cucurbits and flowers under glass. They are often complex; for instance, the control of the blackseed red spider mite by the Chilodromid preditor, and were not possible until the science of entomology had been developed."
4) A general biological control programme will be initiated in 1980. Basically, the programme will consist of production, distribution and evaluation of effectiveness.

The two programmes planned for 1980 are Mexican beetle parasites in the Northeast US and alfalfa predators in the mid-west and other interested areas.

Canada (U.S. Kellerer)

This country does relatively little exchange of entomophagous insects except with the U.S. Most importations are done under contracts with the Commonwealth Institute of Biological Control.

Entomophagous micro-organisms are mainly studied at the Great Lake Forest Research Centre, Sainte Marie. Many (C. Roper, June 19).

The use of entomophagous microorganisms in the control of agricultural pests has recently received much encouragement from the Plant Health Branch.

Among the bacteria studied were the following species: Bacillus thuringiensis, isolated from fruit by larvae, Serratia marcescens, isolated from beetle and corn weevil and the gram Bacteriodes isolated from the pine defoliator.

Among the fungi studied were: four Entomophthora species, Matarizsinium anastomos, Aspergillus flavus and Bacteriobosixis.

The species primarily used for biological control of the fruit fly (Dacryotes spp.) are: Syn*omycetes indicus, Opus sp. and *omycetes ringulare which are bred in commercial quantities at the Central Laboratories of the Plant Health Branch, Ministry of Agriculture and Water Resources, from cultures originally sent from Hawaii.

Considerable efforts are being made for mass rearing and release of Trichogramma spp. There are 18 breeding sites which, from January 1 to July 1979, produced 1,577,114 million specimens; released during that period were 9,830 million specimens on a total area of 35,000 ha of corn, cotton, sugarcane, soybeans, wheat, vegetables, etc.

2.3.1.2 Production of Fungal Growth Inhibitors by Inocula of Geotricum uronumis species (Geotricum).

Three isolates of the take-all fungus, Geotricum uronumis species (Geotricum), were found to produce diffusable fungal growth inhibitors when grown on potato dextrose agar. Possible circumstances where such inhibitors could play a role are: direct inhibition of take-all disease at the rhizosphere. Take-all decline, a depression of disease which occurs after a peak of take-all in monoculture, due to the antagonism which develops in soil when a virulent isolate of GGT is added to the virgin soil in the absence of the host plant, cross-protection of wheat roots against pathogenic isolates, and the production of the isolates together on wheat roots causes inhibition to be produced.

All of these possibilities can be tested by direct experiment.


Using a selective medium, the entomogenous fungi from soil collected in January and March were isolated from Wood ants (Formica rufa) and from soil at the base of trees. Most of the trees had died of Dutch elm disease but some were healthy. It was concluded that B. bassiana was present as conidia which originated from infected insects on soil and the bark. By contrast, M. anisaceae was isolated only once from a sample. Differences in the distribution of these 2 entomogenous entomophagous fungi are discussed. Knowledge of the factors underlying the ecology of entomogenous fungi is of obvious importance in the utilization of these fungi as pathogens of pest insects.


A nematode parasite, Fungus Nanoloxocephala gynopithes, was described and parasitised female nematodes fail to form eggs. The fungal body wall and cuticle and eventually replaces the body contacts with a mass of spore. A late, pseudoeciospores is reported which also kills female nematodes. The release of zoospores by both fungal is described, and their significance in biological control discussed.


In Minnesota, the Pennsylvania state of Ceratocystis fimece is found on spurting mass of C. fimece, the cause of oak wilt. Inoculation experiments showed that if C. fimece was introduced with C. fimece to wounds on healthy Quercus ruberrimus, it had no influence upon development of oak wilt, but if it was introduced 24 h before C. fimece, it prevented infection.

In general, it seems that with a vascular wilt disease a competitor is only likely to prevent infection if it can become established in the infected tissues. If the organism arrives together, the superior adaptation to the host shown by the pathogen will enable it to develop more and less undamaged.


The influence of B. bassiana, an insect of chiton synthesis, on growth of D. interested in Beauveria bassiana, Metarhizium anisaceae 4 species of Entomophthora, E. uliphilus, E. culicis, E. n纲xarzina, E. bassianul and on germination of exotoxin of E. uliphilus and E. bassianul was studied. It was demonstrated that concentrations proposed for practical applications slightly impaired the growth of B. bassiana and M. anisaceae but did not influence the growth of Entomophthora species. The same concentrations stimulated germination of conidia and formation of compatible conidia of E. uliphilus and E. bassianul. Thus, pathogenicity is not impaired, an aspect which could not be considered.
in these experiments, the use of Dimilin could even have a beneficial effect in stimulating the nematode/harvestor relationship.


The injurious effect of Meligethes arenosus, as influenced by population density and nitrogen fertilization (150 and 250 kg N/ha respectively) was investigated in 4-year experiments from 1974 to 1977. From the results of these experiments it is concluded that under very favorable conditions of crop growth, a rape plant would not suffer economic damage when attacked by a number of beetles in the range of 8 to 10 per plant. Under less favorable conditions, however, control measures must be taken in the presence of 5 to 6 beetles. When comparing the 2 fertilization rates (150 and 250 kg N/ha), it appears that damage occurs earlier with the lower rate and also that total crop losses are higher.


Inoculation of wheat seeds with a weak strain of Ophiobolus graminis used to control take-off of celery modifies the amount of chlorophyll a and b in plants and acts as an accelerator to their disappearance. Before eating, less of chlorophyll is destroyed during the dark in the case of inoculated wheat.


A bacterial leaf spot of Johnson grass, Sporobolus airoides, one of the most serious weeds of rape in southern Hungary, was shown to be caused by the bacterium Pseudomonas syringae. The pathogen is probably host specific and may be considered as a useful tool for biological control of the weed.


The spiny bollworm, Earias italica, is an important cotton pest in Africa, the Mediterranean region, and extending to Mexico. The sex pherome used in Israel was an effective attractant for E. italica males and its use in traps for monitoring the pest populations is recommended.


In field tests in small field plots of cotton, applications of a commercial formulation of Bacillus thuringiensis Berliner (107-111 curative) did not adequately suppress heavy populations of Helicoverpa armigera. When chlorothalonil (40 g/a) was applied in combination with this same dose, the level of control increased but did not exceed that provided by chlorothalonil alone. Direct comparisons of the efficacy of the ST formulation (56 g/a) and a commercial formulation of Bacillus thuringiensis (50 g/a)

Laboratory-reared 5th and 6th stage gypsy moth larvae were reared B. pruniaria parasitised eggs placed on gypsy moth diet to induce parasitisation. Laboratory-reared B. pruniaria laid an avg of 900 eggs/female. Rearing survival estimates for each life stage, the ratio of increase in eggs laying females for a generation raised in the laboratory was 1.5-6. Some eggs retained viability when stored at 0-2°C and 40% RH for up to 2 wk. Prey stored at 0-5°C and 100% RH were held successfully for 3 mo beyond the normal adult eclosion period. By proper timing of adult eclosion and egg feeding, the period for biological study of the parasite was extended for 3-4 mo.


Two Chelonus spp., near-curvipes and Prionemus hawalensis, P. hawalensis, were imported from Ethiopia for biological control of pink bollworm, Pectinophora gossypii (Guen.). One was reared on desert pupae with host, weaver ants, and spread its adult emergence with the host into early May. Both the Chelonus spp. and P. hawalensis were reared. Imported from Hawaii, were highly viable, dispersing widely in release fields. However, P. hawalensis did not disperse and could not overwinter, which helped explain this species absence in subsequent years. The numbers of the Chelonus spp. in succeeding years following release may result from the lack of suitable host stages in springtime.


a-Tomatine, an alkaloid in tomato plants, is toxic to Heliotrope (Heliotropium), an osteosperma of Heliotropium (Heliotropium), a major hedgerow pest of roses. The parasite acquires the alkaloid from its host after the host ingests the alkaloid. Results are based on the use of artificial diets for the host containing 0.6 and 0.5% wet weight a-tomatine. This form of interaction causes a potential dilemma in controlling herbivorous pests through chemical antiques in plants.

4. Training Courses

Monitoring the Side Effects of Pesticide Use, Imperial College at Silverwood Park, Ascar, Berks, UK, April 8-19, 1980.

A course sponsored by the British Council which aims to bring together experts involved in research, development, conservation and administration. The programme will consist of talks, discussion groups and visits. Participants will be invited to discuss methods and problems encountered in their own country. The Director of Studies will be Dr. G.J. de Paepke, a British Council of the Dept. of Zoology and Applied Entomology at Imperial College, London.

The outline programme is as follows: hazards of pesticides to operators, monitoring the hazards of pesticide residues to consumers, design of monitoring programmes to assess environmental hazards on wildlife, monitoring long-term effects of pesticide use.

Contributions are expected from such leading organisations as Rothamstead Experimental Station, Pest Insect Control Laboratory, Waltham Forest, Section of the Forestry Commission, Institute of Terrestrial Ecology, ICI and the Laboratory of the Government Chemist.

This is a residential course and the fee will be £170. There are vacancies for 25 students.

S. Abstracts from Entomophasia

(Prepared by Courtesy of B. Harpin, INRA)

ENTOMOPHASIA, volume 24 (4), 1979

J.M. Fraser & R. Holper, Institut für biologische Schädlingsbekämpfung, Bundesrepublik Deutschland. Field tests using insect-pathogenic viruses in Europe.

The results of an inquiry are presented, dealing with the experimental and field use of insect-pathogenic viruses in Europe. For the 42 examples listed, details are given concerning pest insect species, virus, dosage or concentration, amount of water, technique of application, insect tested, efficacy, remarks, cooperating researchers (names of correspondents, order, country). The field experiments comprise 17 species of Lepidoptera, 1 Diptera, 1 Hymenoptera, and were carried out in 13 countries.

G.L. Lee, B.B. Pask & K.Y. Yeung, Department of Entomology, University of Kentucky, Lexington, 1. 25405346, USA. Developmental rates of Pseudonothos busseifer (Hym. Mymaridae) and the effect of host age age on parasitism. This information was needed to increase the efficiency of parasite production and provide better timing of parasite release for establishment.

C. Piek, I. Petso & M.C. Martes, University of Iasi & Research Institute for Ceratias and Technical Plants, Fundația, Romania. Species of Entomophaga (Hym., parasites of some lepidopterous pests of cocoa in Romania.

Eleven species of Tachinidae were identified as parasites of lepidopterous pests of cocoa. All of the parasitised Lepidoptera have been listed as pests of cocoa in Romania.


Various species of prey were given to larvae of Aedes/us neumanni. Duration of larval development was used to gauge their nutritive value. A. interstices is chiefly a predator of thrips but it can also prey on azuki.


A 2-year survey of brown soft scale was conducted from winter 1976 to winter 1978 in Bond Head, Ontario. Their impact on citrus black spot populations was measured under field conditions using live plants and producing exclusion alone. Feeding experiments were conducted to determine specific plant on different citrus black spot stages.


Agrotrichium geylini, a new species described by L. J. Imel, is associated with the disease. Reduction in citrus in all citrus crops grown under 72 and 100% compared with plants treated with water.

Ferrin, J.M. and Laranja, ENA, Departamento de Zootecnia, UNESP, Brazil. The pathogen was identified in citrus. The pathogen was isolated from citrus in Brazil.

Y. Rossier, Institute for Biological Control, Citrus Marketing Board, Rehovot, Israel. Authorised trading of Citrus aurantium (Dip. Tephritis). The development of strains with reduced or eliminated puerperal fruit colour deficiency.

The effect of a large black spot, caused by the Mediciacean fruitfly on citrus, shows that the disease is caused by the Mediciacean fruitfly. The disease is transmitted to citrus by this fly and is known as black spot.