

IOBC Newsletter

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IOBC in Mourning



The death, on April 26, of Emile BILIOTTI, aged 55, greatly saddened and shocked his parents and many friends.

The IOBC is in mourning; the Organization has lost its President, and the West Palaearctic Regional Section its former President who, from 1968 to 1977, had guided it

so brilliantly. 'Bil', as his friends called him, was a man of prodigious intelligence and was exceptionally dynamic and generous. These many qualities, which were already apparent at the Toulon Lycee where he excelled, made him a student of particular promise at the National Institute of Agronomy in Paris. His aptitude for the biological sciences subsequently determined the orientation of his career towards phytosanitary research, and his entry in 1947 to the National Institute of Agronomic Research (INRA).

The first work of the young researcher was mainly concerned with a study of forest biocoenoses and, more particularly, the pine and oak procession moths, two important pests in the Mediterranean Basin. These investigations are reported in 24 remarkable publications; they comprise specific studies of parasite complexes, especially tachinid flies.

The quality of these studies quickly alerted Emile Biliotti's superiors, particularly since, from the very beginning, he endeavoured to elucidate the complicated mechanisms governing population dynamics, thus aligning with the ecological approaches recommended by IOBC.

Together, his gifts of researcher and organizer led to rapid promotion in INRA, and increased recognition at the international level. Following his appointment as 'Assistant' in 1948, his career advanced at a rate which cannot be equalled. In 1952, he became 'Chargé de Recherches'; in 1957, Director of the Station of Zoology and Biological Control at Antibes, as well as 'Maitre de Recherches'; in 1961, Director of Research, and in 1963, Director of the Agronomic Research Centre at Antibes.

The following major publications date from this period: *Phoracantha semipunctata* on *Eucalyptus*, possibilities of using *Doryphorophaga doryphorae*, *Elatophilus nigricornis* on maritime pine, and *Phanerosoma flavitestacea* antagonist of *Ectomyelois ceratoniae*. Numerous, more general studies are of considerable value in defining the means of attaining the different objectives of the Centre.

Under his expert direction, the Antibes Station, made up of enthusiastic researchers working in a real family spirit, has considerably expanded its international influence, thus contributing to the growing prestige of France in the field of biological and integrated control. Moreover, on the initiative of the Station's young Director, development of scientific activities was enhanced by the establishment of the Valbonne Research Centre, situated near Antibes.

Because of his deep interest in IOBC, and especially since the Organization's objectives identify with his own way of approaching problems, Emile Biliotti was appointed President in 1968, a post which he was to occupy with great competence for 9 years. From the beginning of 1977, he was made President of the World IOBC, and, in October of the same year, Honorary President of IOBC/WPRS.

The Governing Board of INRA accordingly directed the destiny of this man of exceptional qualities by appointing him, from 1967, as Director of the Central Zoology Station at Versailles and Head of the INRA Zoology Department. Six years later, he assumed the highest office in phytosanitary research in France in his capacity as Inspector-General of Agronomic Research. Under his direction, research followed a course ensuring harmony of the economic, ecological and toxicological requirements to which plant protection must adhere. In encouraging these developments within the large and well structured institution of INRA, France has gradually gained superiority among the countries concerned with safeguarding the environment, without falling foul of theoretical systems devoid of practical value. The options to adopt within the frame of modern plant protection are clearly defined in the lecture which Emile Biliotti addressed to the Commission of the European Communities in 1975, where economic factors were considered. This fundamental study outlined the way to optimize agricultural production using integrated systems, and is thus of great interest.

In spite of the exhausting tasks which he assumed, Emile Biliotti was willing to accept many other offices, such as President of the Zoological Society of France and that of the Entomological Society of France. In addition, he made a much appreciated contribution in his capacity as a member of the Standing Committee for International Plant Protection Congresses and as a member of the International Entomology Congress. FAO also took advantage of his advice by appointing him as a member of the Panel of Experts on Integrated Pest Control.

Emile Biliotti was Chevalier de la Légion d'Honneur, Officier du Mérite Agricole and Officier des Palmes Académiques; he has been torn away with an untimely brutality from his family and so many friends, leaving a great void which only the bright memory of this exceptionally warm-hearted and intelligent man can illuminate.

The IOBC in mourning, bows before its President and Honorary President, who gave so much; the Organization will always remember him by the indissoluble bonds of congeniality, admiration and friendship.

G. MATHYS

IOBC Secretariat

1. The Executive Committee of IOBC met on 25-26 September, 1978 and proposed that Professor C.B. Huffaker, past President of IOBC should be asked to secure the *ad interim* chairmanship of IOBC for the 2 years to come. Meanwhile Professor Huffaker accepted to serve again for the fill-in period; this is gratefully acknowledged.

2. Elections for the Governing Board of IOBC will be prepared on the occasion of the next General Assembly of IOBC in 1980 during the 16th International Congress of Entomology in Kyoto (Japan). IOBC Executive and Council meetings will be held in Washington DC during the IXth International Plant Protection Congress.
3. Abstracts of articles published in *Entomophaga* will regularly appear in the IOBC Newsletters.

News from the IOBC Sections

East Palearctic Regional Section

Governing Board as from April 1977

President

Y.N. FADEV Academy of Agricultural Sciences, Ministry of Agriculture, Orlikov pereulok 1/11, SU-Moscow 107139 (Soviet Union)

Vice-President

E.J. LIPA Plant Protection Research Institute, Ul. Miczurina 20, PL-60-318 Poznan (Poland)

Secretary-General

V. LEBEDEV Ministry of Agriculture, Orlikov pereulok 1/11, SU-Moscow 107139 (Soviet Union)

Statutes and Rules of Procedure have been adopted.

Members of the Council

G.I. POLIANOV Dept of Plant Protection, Ministry of Agriculture, Bd Dragan Zankov 6, GB-Sofia (Bulgaria)

L. WEINA Research Institute for Plant Protection Herman Otto ut 15, HU-Budapest 11

A. SMETNIK Ministry of Agriculture, Orlikov pereulok 1/11, SU-Moscow 107139

V. LANDA Institute of Entomology, Academy of Sciences, Vinicna 7, CZ-Prague 2

Alternate Members

H. SANDER Institute for the Environment, Academy of Agricultural Sciences, PL-Warsaw

K.V. NOVOJILOV All-Union Scientific Research Institute for Plant Protection, Pushkin-6, Shosse Podbelskogo 3, SU-Leningrad 188620

Members of the East Palearctic Regional Section (EPRS)

Countries

BULGARIA Agrochemical Service, Ministry of Agriculture, Bd Dragan Zankov 6, BG-Sofia

CZECHOSLOVAKIA Technical Committee for the co-operation in biological control, Ministry of Agriculture, Tesnov 65, CS-Prague 11

GERMAN DEMOCRATIC REPUBLIC Central Plant Protection Service, Ministry of Agriculture, Hermannswerder 20 A, DD-15 Potsdam

Plant Protection Research Institute, Academy of Agricultural Sciences, Stahnsdorfer Damm 81, DD-Kleinmachnow

HUNGARY Plant Protection Research Institute, Herman Otto ut 15, HU-Budapest 11

POLAND Plant Protection Research Institute, Ul. Miczurina 20, PL-60-318 Poznan

ROMANIA Research Institute for Plant Protection, Bd Ion Ionescu de la Brad 8, Sectorul I, RO-Bucarest 1

SOVIET UNION General Plant Protection Service, Ministry of Agriculture, Orlikov pereulok 1/11, SU-Moscow 107139

All-Union Scientific Research Institute, Pushkin-6, Shosse Podbelskogo 3, SU-Leningrad 188620

Institute for Research in Biological Control, Kisbinez/Moldavia

Permanent Commissions

Commission	Chairman
1. Publications	G.A. BEGLIAROV (SU)
2. Weed control	A. KAITAZOV (BG)
3. Microbiological control	J. WEISER (CS)
4. Integrated protection systems	T. BAICU (RO)
5. Genetic control	Barnabash NAGY (HU)

West Palaearctic Regional Section (WPRS)

Past Secretary-General and Vice-President of the WPRS Lukas BRADER has been appointed Chief of the FAO Plant Protection Service in Rome as from 1977; we extend him our congratulations, and wish him every success.

WPRS is organizing a symposium on integrated control in Vienna (AT) from 8 to 12 October, 1979, with the aim of reviewing recent advances in technologies leading to the implementation of integrated plant protection systems. Emphasis will be placed on developments and their economic significance in various crops in the West Palaearctic region. The meeting will be held at the Hofburg; please contact Prof. K. Russ, Bundesanstalt für Pflanzenschutz, Trunnerstrasse 5, Postfach 154, AT-1021 Vienna (Austria).

South and East Asian Regional Section (SEARS)

A.I. MOHYUDDIN, Secretary Treasurer (Commonwealth Institute of Biological Control, P.O. Box 8, PK-Rawalpindi (Pakistan)) is organizing working groups for the biological control of *Plutella* spp., *Cordia* spp. and graminaceous borers. As a starting point, exchange of correspondence among specialists took place. Members of SEARS interested in these studies are invited to contact Dr Mohyuddin.

Y.C. PAN and G.T. LIM from the Entomology Department, Sugarcane Experiment Station, Gula Perak Berhad, at Pentai Remis, Dindings, Perak, W. Malaysia, submitted the following interesting information:

Biological Control of Sugarcane Moth Borers in Malaysia

The sugarcane moth borers, *Tetramoera schistaceana* Snell., *Cbilo sacchariphagus* Bojer, *Cbilo* sp.? *terrenellus* Rag., *Emmalocera umbricostella* Rag. and *Sesamia inferens* Walk. are the main pests of sugarcane in Perak, Malaysia. The available sugar content of partly and severely affected cane was reduced to 13-14% and 22-24%, respectively, due to infestation by these borers.

For 5 consecutive years, the trichogramma method has been successfully utilized for the control of these borers. Species of the indigenous egg parasitoids *Trichogrammatodea nama*, *Trichogramma australicum*, *T. japonicum* and *T. chilotraeae* were released in cane fields (average of 15,000 adults/ha/year). Releases during the years 1971-1976 yielded the following results:

Year	Liberation areas Bored nodes (%)	Check areas Bored nodes (%)	Area (ha)
1971-1972	1.31	3.76	1,600.00
1972-1973	1.22	2.72	2,768.64
1973-1974	0.55	3.05	2,848.64
1974-1975	0.48	2.04	2,694.16
1975-1976	1.89	4.82	2,617.87

Costs Involved were about M\$7.00/ha.

In Malaysia, the trichogramma method can be used for other crop pests, especially for the control of rice and maize stem borers.

Malaysian Egg Parasitoids Successfully Control the Giant Sugarcane Borer *Phragmatocia gumata* Swinhoe

Phragmatocia gumata Swinhoe is one of the giant sugarcane borers threatening the sugar industry in Malaysia. Outbreaks have occurred in Perak, Johore and Negeri Sembilan. A survey of the borer's natural enemies was undertaken from 1975 to 1976. The natural enemies recorded are: the egg parasitoid, *Tumidiclava* sp. (Trichogrammatidae), larval parasitoid, *Rhaconotus* sp. (Braconidae) and pupal parasitoid, *Xanthocampoplex* sp.n. *nigromaculata* (Cam.) (Ichneumonidae). All of these parasitoids are first records and the pest has not yet been found outside Malaysia. *Tumidiclava* sp. is the most effective egg parasitoid. Mass production of this parasitoid is being carried out at the Sugarcane Experiment Station, Gula Perak Berhad, for use against the giant borer.

Abstracts from Entomophaga 23 (1-3), 1978 (Prepared by Courtesy of B. Hurpin, INRA)

ENTOMOPHAGA, volume 23 (1), 1978

G. CROIZIER & C. VAGO, INRA, St-Christol-les-Alès, France. Considerations on the present distribution and diversification of the *Baculovirus* group.

Over the last ten years, there have been reports in the literature of viruses with the same characteristics as *Baculovirus* but in different groups, including vertebrates, insects, acari, a crab and, possibly, also in an entomopathogenic fungus. The importance of such a widely distributed virus-type is discussed in relation to comparative pathology, general virology and the use of viruses for control of insect pests.

A. PANIS & J.P. MARRO, INRA, Antibes, France. Behavioural variations in *Metaphycus lounsburyi* (Hym.: Encyrtidae).

Three natural populations of *Metaphycus lounsburyi*, from Spain, Italy and California, show differences of behaviour and biotope but are not morphologically distinguishable. The authors consider it, therefore, as a super-species and the semi-species it comprises may be used complementarily as biological control agents.

S. HASAN, CSIRO, Montpellier, France. Biology of a buprestid beetle, *Sphenoptera clarescens* (Col.: Buprestidae), from skeleton weed, *Chondrilla juncea*.

Investigations carried out in Iran to find biological control agents for skeleton weed (*Chondrilla juncea*), showed the buprestid, *Sphenoptera clarescens*, to be one of the insects highly damaging to the weed. The larvae of this beetle were active throughout the *Chondrilla* season and fed mainly on the rootstocks, causing a progressive decline in natural *Chondrilla* populations. The host range of the beetle was examined both in the field and in the glasshouse. As lettuce, *Lactuca sativa*, and endive, *Cichorium endivia*, could have been at risk in Australia, studies were discontinued.

S. HASAN, CSIRO, Montpellier, France. Biology of the root coccid, *Neomargarodes chondrillae* (Hem.: Margarodidae) living on *Chondrilla juncea* and related plants.

During investigations in the Middle East on biological control agents of skeleton weed (*Chondrilla juncea*), a coccid, *Neomargarodes chondrillae*, was found to be highly damaging. In N.W. Iran, the coccid plays an important role in the reduction of *Chondrilla* populations in nature. Under field conditions, *N. chondrillae* was found to attack *Lactuca orientalis* and *Cichorium intybus*, wild Compositae related to *C. juncea*; thus its use in biological control would pose risks to certain cultivated plants.

R. LEVY & T.W. MILLER, Jr, Lee County Mosquito Control District, Fort Myers, Florida. Tolerance of the planarian *Dugesia dorocephala* to high concentrations of pesticides and growth regulators.

In laboratory tests, *Dugesia dorocephala* (Woodworth) was exposed to various insecticides for 24 h without the production of immediately recognizable or delayed effects to the viability, behaviour, and asexual reproductive capacity of this planarian. *D. dorocephala* tolerated relatively high concentrations of the pesticides and growth regulators, suggesting its potential for integrated mosquito control.

Post-exposure observations on the asexual reproductive capacity of *D. dorocephala* that were initially reared in water with a variable chloride content indicated the possibility of artificially stimulating asexual reproduction; hence, mass production might be possible by exposing *D. dorocephala* to some pesticides and growth regulators and/or by subjecting it to changes in chloride or salinity levels.

C.G. JACKSON, J.S. DELPH & E.G. NEEMANN, Cotton Insects Biological Control Laboratory Tucson, Arizona. Development, longevity and fecundity of *Chelonus blackburni* (Hym.: Braconidae) as a parasite of *Pectinophora gossypiella* (Lep.: Gelechiidae).

Development, longevity, and fecundity of *Chelonus blackburni*, a uniparental egg-larval parasite of pink bollworm, *Pectinophora gossypiella*, were studied in the laboratory. The habits of and brief descriptions for the egg and larval stages are given.

P. DELATTRE, INRA, Guadeloupe. Conditions of establishment and dispersion of *Apanteles flavipes* (Hym.: Braconidae), parasite of sugarcane borers of the genus *Diatraea* (Lep.: Pyralidae) in Guadeloupe.

Apanteles flavipes has been produced in the laboratory in Guadeloupe since 1970, and several hundred thousand were released on defined areas of the island.

Establishment of this entomophagous insect was observed regularly, for some months after the releases. However, the insect's adaptation to winter climatic conditions seems to be poor and the survival rate after the winter period is not sufficient to allow natural recolonization of the sites.

E.F. LEGNER, University of California, Riverside. Mass culture of *Tilapia zillii* (Cichlidae) in pond ecosystems.

The culture of *Tilapia zillii* for biological control of mosquitoes and chironomid midges, in earthen ponds at 3 initial stocking densities, 6, 9 and 12 pairs, revealed an optimum initial density of 9 pairs for the maximum production of fry after 104 days. An estimated 1 million fish could be produced in 104 days from 190 similar ponds with a water surface equivalent to 0.8 ha. Possible ways to increase rearing efficiency are discussed.

F.M.E. WANJALA, Coffee Research Station, Ruiru, Kenya. Relative abundance and within canopy distribution of the parasites of the coffee leafminer, *Leucoptera meyricki* (Lep.: Lyonetiidae) in Kenya.

This paper examines the abundance and vertical distribution of parasites of *L. meyricki* within the canopy of capped and uncapped coffee. Capped canopies are formed by cutting back apical growth to form a spreading canopy up to 210 cm above the ground. Uncapped canopies, on the other hand, allow free growth, kept within reach of coffee pickers by frequent pruning and desuckering.

The most abundant parasite species at all sites were *Achrysocharella ritcbiei*, *Zagrammosoma variegatum*, *Pediobius coffeicola* and *Agentaspis* sp.

P. BARBOSA, E.A. FRONGILLO Jr & W. CRANSHAW, University of Massachusetts. Orientation of field populations of *Brachymeria intermedia* (Hym.: Chalcididae), to host and host-habitat cues.

Brachymeria intermedia, a pupal parasitoid of the gypsy moth, was caught in the field using plexiglas traps coated with Tangle-trap. Significantly greater numbers of females were collected in traps baited with gypsy moth pupae than in traps with male or female *B. intermedia* or traps painted yellow.

A greater number of *B. intermedia* emerged from gypsy moth pupae in woodland edge sites than from pupae in interior woodland sites.

D.E. BERUBE, Research Station, Regina, Saskatchewan, Canada. Larval descriptions and biology of *Tephritis dilacerata* (Dip.: Tephritidae), a candidate for the biocontrol of *Sonchus arvensis* in Canada.

The immature stages of *Tephritis dilacerata* are described. Main aspects of the biology including phenology and diapause, reproduction, oviposition, host-plant relationships, are studied. Because of the large European distribution of this fly, *T. dilacerata* is considered a promising biocontrol agent for the perennial sow thistle in Canada.

L.C. LEWIS & R.E. LYNCH, Corn Insects Research Unit, Ankeny, Iowa. Foliar application of *Nosema pyrausta* for suppression of populations of European corn borer.

The percentage of corn borer larvae infected with *Nosema pyrausta* as a result of foliar application of vacuum dried spores averaged over treatments and years was 63.8 for the simulated 1st-generation tests and 97.2 for simulated 2nd-generation tests.

The full potential of the suppression of European corn borer populations achieved by foliar application of *N. pyrausta* will be apparent in filial generations, since *N. pyrausta* is transmitted transovarially from 1 generation of the corn borer to the next.

Y. RECHAV, The Volcani Center, Bet Dagan, Israel. Biological and ecological studies of the parasitoid *Chelonus inanitus* (Hym.: Braconidae) in Israel. III. Effects of temperature, humidity and food on the survival of the adult.

The effects of temperature, humidity and food on the survival of *Chelonus inanitus* adults were studied in the laboratory.

Y. RECHAV, The Volcani Center, Bet Dagan, Israel. Biological and ecological studies of the parasitoid *Chelonus inanitus* (Hym.: Braconidae) in Israel. IV. Oviposition, host preferences and sex ratio.

The oviposition rate of fertilized and unfertilized females of *Chelonus inanitus* was studied at different temperatures. *C. inanitus* can develop in various hosts, but the females prefer to lay their eggs in those of their natural hosts, *Spodoptera littoralis* and *Spodoptera exigua*. The sex ratio of *C. inanitus* is affected by environmental conditions.

A.G. RASKE, Newfoundland Forest Research Centre St. John's, Canada. Parasites of birch casebearer larvae in Newfoundland (Lep.: Coleophoridae).

The birch casebearer, *Coleophora fuscedinella*, is the most important pest of white birch, *Betula papyrifera*, in Newfoundland. A total of 31 species of parasites and hyperparasites was reared from birch casebearer pupae in this study.

ENTOMOPHAGA, volume 23 (2), 1978

M. YASEEN, CIBC, Trinidad, West Indies. The establishment of two parasites of the diamond-back moth *Plutella xylostella* (Lep.: Plutellidae) in Trinidad, W.I.

The diamond-back moth, a major pest of cruciferous crops in Trinidad, is resistant to several pesticides. Indigenous parasites are unable to exert economic control. *Apanteles plutellae* (Kurdj.) and *Tetrastichus sokolowskii* Kurdj. were introduced and are now well established. It is recommended that additional parasites, such as *Macromalon* sp. and *Thyraeella collaris* (Grav.) be introduced in order to obtain complete biological control.

M. LARAICHI, Ecole Nationale d'Agriculture, Meknès, Maroc. Etude de la compétition intra- et interspécifique chez les parasites oophages des punaises des blés.

In a study of interspecific competition within the populations of oophagous parasites of wheat bugs, the species *Ooencyrtus fecundus* Ferr. & Voeg. appeared to be more competitive than *Asolcus* and *Trissolcus* species.

Suppression of supernumerary larvae is a result either of lack of nutrients or a cannibalism phenomenon.

M. LARAICHI, Ecole Nationale d'Agriculture, Meknès, Maroc. Le phénomène de superparasitisme chez les parasites ophages des punaises des blés.

A study of superparasitism in the oophagous parasites of *Aelia* spp. has been carried out with 3 *Ooencyrtus* species: *O. fecundus* Ferr. & Voeg., *O. nigerrimus* Ferr. & Voeg. and *O. telonomioides* Vass.

These 3 species appeared to have a discriminating ability which enabled them to avoid superparasitism when the host population at their disposal was sufficient. Conversely, or when the number of females increased in the same tube, superparasitism tended to increase.

Superparasitism results in a decrease in fecundity as well as in the size and sex ratio of the offspring.

SUDHA NAGARKATTI & H. NAGARAJA, Indian Station, CIBC, Bangalore, India. Experimental comparison of laboratory reared vs. wild-type *Trichogramma confusum* (Hym.: Trichogrammatidae). I. Fertility, fecundity and longevity.

Females of *Trichogramma confusum* reared in the laboratory on eggs of *Coreyra cephalonica* showed a higher degree of sterility than wild-type females, while sterility of males did not differ significantly. Laboratory reared females lived longer than wild-type females but produced fewer progeny.

C.A. DEDRYVER, INRA, Laboratoire de Zoologie, Rennes, France. Facteurs de limitation des populations d'*Aphis fabae* dans l'Ouest de la France. III. Répartition et incidence des différentes espèces d'*Entomophthora* dans les populations.

Several species of *Entomophthora* are involved in the natural control of *Aphis fabae* Scop. on field beans (*Vicia faba*) in the West of France. The respective importance of each species was assessed in 1971 and from 1973 to 1975. *Entomophthora fresenii* Nowak. is the species most completely and quickly dispersed in the field, and the most efficient in the colonies.

Factors inherent to *E. fresenii* (specificity, nature of its life-cycle, dependence on aphid aggregation) and ecological factors, such as response to climatic variations, may explain the predominance of this species. All these factors must be studied for a better knowledge of this species.

H. KLUMP & B.J. TERRINK, Research Institute for Nature Management, Arnhem, Netherlands. The elimination of supernumerary larvae of the gregarious egg-parasitoid *Trichogramma embryophagum* (Hym.: Trichogrammatidae) in eggs of the host *Ephesttia kuehniella* (Lep.: Pyralidae).

Some supernumerary larvae of *Trichogramma embryophagum* Htg. die shortly after all the food in the egg of *Ephesttia kuehniella* Z. has been ingested. The food previously swallowed by the dead parasitoids is ingested by surviving larvae. Thus, 3 larvae always survive to the adult stage in eggs of *E. kuehniella*.

R. AHMAD, South American Station, CIBC, Bariloche, Argentina. Note on breeding the Argentine stem weevil *Hyperodes bonariensis* (Col.: Curculionidae) and its egg parasite *Patasson atomarius* (Hym.: Mymaridae).

Breeding techniques are described, including germinating seedlings of *Triticum aestivum* and *Poa annua* in continuous dark, to break the ovial diapause of *Hyperodes bonariensis* Kuschel and development of a rearing system for both the weevil and its egg parasite, *Patasson atomarius* Brethes.

G. FABRES, ORSTOM, Nouméa, Nouvelle-Calédonie. *Aphytis benassyi*, nouvel hyménoptère *Aphelinidae* du groupe *vittatus*, parasite de *Lepidosaphes beckii* (Hom.: Diaspididae) dans l'Arc mélanésien.

This *Aphytis* species, which attacks *Lepidosaphes beckii* Newmann on *Citrus* sp. in several islands of the South Pacific region, belongs to the *vittatus* group.

A key to the species of the West Pacific Region is given.

J.B. CARTER, School of Agriculture, The University, Newcastle upon Tyne, England. Field trials with *Tipula* iridescent virus against *Tipula* spp. larvae in grassland.

The *Tipula* iridescent virus was introduced into populations of *Tipula* spp. in plots of grassland using live and dead *Tipula oleracea* L. larvae, as a bran bait or by sprayed aqueous suspensions. The majority of larvae sampled at intervals of 2 months were not iridescent and did not become iridescent when they were incubated in the laboratory.

The results show that all the treatments introduced the virus into one or more of the tipulid populations but with low efficiencies.

J.A. MCMURTRY, E.R. OATMAN, P.A. PHILLIPS, C.W. WOOD, University of California, Riverside & Agricultural Pest Management Service, Ventura, California, USA. Establishment of *Phytoseiulus persimilis* (Acari: Phytoseiidae) in Southern California.

Annual releases of *Phytoseiulus persimilis* A.-H. in commercial strawberry fields in Ventura County, California, beginning in 1971, have resulted in the establishment of this predator on strawberry, lima beans, and weeds such as *Malva*, *Solanum* and *Convolvulus* spp., throughout the Oxnard area. These weed species apparently are important reservoirs from which *P. persimilis* disperses to new plantings of strawberries each season. This predator is now an important factor in the suppression of *Tetranychus urticae* (Koch) on strawberry and probably on lima beans in Ventura County.

G. ZIMMERMANN, Biologische Bundesanstalt für Land- und Forstwirtschaft, Institut für biologische Schädlingsbekämpfung, Darmstadt, Deutschland. *Entomophthora blunckii* on *Plutella maculipennis*: isolation and new description.

Entomophthora blunckii Lakon ex Zimmermann was isolated from larvae of the dangerous moth *Plutella maculipennis* Curt. and redescribed. The species grows on coagulated egg yolk, less well on Sabouraud-dextrose-agar. Growth was observed between 8 and 28 °C but not at 32 °C. The fungus is compared with similar species.

Claire ATHIAS-HENRIOT, INRA, Dijon, France. Définition de *Dictyonotus* nov. gen., avec description de deux espèces nouvelles de France méridionale (Gamasides, Phytoseiidae).

The type species of this new holarctic genus is *Amblyseius buron* Chant & Hansell 1971. Two new species, *Dictyonotus saureli* and *D. insularis* have been collected from trees in an orchard near Avignon.

T.H. CHUA, University of Malaya, Kuala Lumpur, Malaysia. The parasite complex of *Saissetia nigra* in Malaysia.

The percentage parasitism of *Saissetia nigra* (Nietner) by chalcidoid parasites and the relative abundance of individual parasites was studied in the field using *Hibiscus rosa-sinensis* as the host plant.

D.E. PINNOCK & J.E. MILSTEAD, University of California, Berkeley, USA. Microbial control of the fruit tree leafroller, *Archips argyrospila* (Lep.: Tortricidae) in California.

From spray applications of *Bacillus thuringiensis* preparations, serotypes I and III, and of a granulosis type *Baculovirus* to field populations of larvae of *Archips argyrospila* (Wlk.) it is concluded that *B. thuringiensis* and the granulosis virus are promising control agents for this fruit tree leafroller.

ENTOMOPHAGA, volume 23 (3), 1978

L.E. EHLER & J.C. MILLER, University of California, Davis, USA. Biological control in temporary agroecosystems.

The attributes of both natural enemies and pest species in temporary agroecosystems are discussed. Analysis of natural biological control of noctuid pests in California cotton provides empirical support for the view that certain natural enemies (a complex of polyphagous predators) are well adapted to habitats of low durational stability and that such enemies are fully capable of effecting pest suppression in these habitats.

A. HONECK, Research Institute for Plant Protection, Praha, Czechoslovakia. Trophic regulation of postdiapause ovariole maturation in *Coccinella septempunctata* (Col.: Coccinellidae).

In 1977, the vernal maturation of *Coccinella septempunctata* L. females was investigated in relation to variation in aphid population density on alfalfa and cereals in central Bohemia. The ovarioles do not ripen unless the aphid population density reaches a certain threshold. This leads to considerable variability in the time of vernal reproductive activity among subpopulations living on crops with different aphid densities. This mechanism enables reproduction of the aphidophagous insect to synchronize with population development of the aphid.

H. MALEKI-MILANI, INRA, Guyancourt, France. Influence of successive passages of nuclear polyhedrosis virus of *Autographa californica* in *Spodoptera littoralis* (Lep.: Noctuidae).

Adaptation of the *Autographa californica* nuclear polyhedrosis virus (*Baculovirus*) by successive passages of orally fed inclusion bodies in a new host (*Spodoptera littoralis*) was unsuccessful. It is demonstrated, by using biochemical identification methods as well as specificity difference indices, that the occult virus of *S. littoralis* is revealed by the artificial infection of the *A. californica* nuclear polyhedrosis virus.

JUNJI HAMAI & C.B. HUFFAKER, University of California, Berkeley, USA. Potential of predation by *Metaseiulus occidentalis* in compensating for increased, nutritionally induced, power of increase of *Tetranychus urticae*.

The study was conducted to test whether or not comparable results might be obtained using the two-spotted mite and a different predator on strawberry, and extended over a long period of population interaction. The object was to determine if, in this case, *Metaseiulus (Typhlodromus) occidentalis* (Nesbitt) could keep the spider mite population under good control in spite of an increase in prey mite fecundity or intrinsic rate of increase due to improved nutritional qualities of the strawberries over a relatively long period of time. The results showed the numerical response of the predator to be sufficient to respond to and control the prey population under both high and low fertilization, although economic control was less reliable under high nitrogen.

D. GONZALEZ, W. WHITE, J. HALL & R.C. DICKSON, University of California, Riverside, USA. Geographical distribution of Aphidiidae (Hym.) imported to California for biological control of *Acyrtosiphon kondoi* and *Acyrtosiphon pisum* (Hom.: Aphididae).

A survey for *Acyrtosiphon kondoi* and its insect enemies was conducted in 1976-1977 in Afghanistan, Belgium, Czechoslovakia, Greece, Iran, Israel and Morocco, in order to determine the geographical distribution of this species in alfalfa-growing areas and to collect parasitic Hymenoptera from different geographical areas to evaluate their effectiveness as biotypes against *A. kondoi* in the different climatic zones where it damages alfalfa in California. The results show the origin of distribution of *A. kondoi* may be Central Asia, and that populations of *Aphidius ervi* may be most suitable for colonization programs against *A. kondoi*.

Y. CARTON, CNRS, Gif-sur-Yvette, France. Biology of *Pimpla instigator* (Hym.: Ichneumonidae). IV. Larval development as a function of egg-laying site; role of the host's hemocytic reactions.

Pimpla instigator females, parasites of *Pieris brassicae* pupae, lay their eggs in a highly selective manner in the central region of the host. It is precisely in this region of the host that the hemocytic reaction is the weakest and, thus, where parasite development is most favoured. By experimental deposition of eggs, it is shown that there is a close correlation between the hemocytic reaction of the host and parasite mortality.

G. FAUVEL, A. RAMBIER & D. COTTON, INRA, Montpellier, France. Predacious activity and multiplication of *Orius (Heterorius) vicinus* in ash spangle galls.

Studies undertaken on the fauna of ash spangle galls in Bartheleasse island near Avignon (France) show that this fauna is

highly diversified, with 4 main interacting elements: the eriophyid mite *Eriophyes fraxinivorus*, the predatory cecidomyid *Arthrocnodax fraxinella* and different phytoseiid mites (*Amblyseius aberrans*, *Typhlodromus* sp.), and the anthocorid *O. vicinus*. This species has the potential of attaining high numbers when galls are very numerous. However, the reservoir effect of such a tree is affected by the still unknown conditions determining cecidogenesis.

R.V. DOWELL & D.J. HORN, The Ohio State University, Columbus, Ohio, USA. Mating behavior of *Bathyplectes curculionis* (Hym.: Ichneumonidae) a parasitoid of the alfalfa weevil, *Hypera postica* (Col.: Curculionidae).

The high activity of virgin females combined with their polygamy and long period of sexual receptivity may facilitate maximum gene flow between local *B. curculionis* populations. This high genetic diversity may be partially responsible for the widespread occurrence of *B. curculionis* in North America.

W. TANKE & J.M. FRANZ, Institut für biologische Schädlingsbekämpfung, Darmstadt, Fed. Rep. of Germany. Side-effects of herbicides and their metabolites on beneficial insects.

The effect of 5 herbicides used in agriculture were studied, mainly in the laboratory, by measuring the reduction in beneficial effects of three entomophagous insects showing quite different behaviour: *Trichogramma cacoeciae*, *Chrysopa carnea* and *Epistrophe balteata*. Damage observed depends on the species as well as on the herbicide applied and the type of application. Destruction of sensitive entomophagous species in the field might well occur according to the results obtained in experiments using certain herbicides.

D.P. BARTELL & B.C. PASS, University of Kentucky, USA. Effects of *Bathyplectes curculionis* and *Bathyplectes anurus* (Hym.: Ichneumonidae) on the growth and development of *Hypera postica* (Col.: Curculionidae).

Observations, linear measurements, dissections and histological preparations were made of parasitized and non-parasitized larvae of the alfalfa weevil, *Hypera postica*, on a daily basis. Adult and larval parasites significantly altered growth and development of *H. postica* larvae.

E.F. LEGNER & S.C. TSAI, University of California, Riverside, USA. Increasing fission rate of the planarian mosquito predator, *Dugesia dorotocephala*, through biological filtration.

The freshwater planarian, *Dugesia dorotocephala* (Tricladida, Planariidae), an effective predator of immature mosquitoes is being subjected to mass culture studies. This study investigates the use of a gravel filter in combination with the aquatic plant *Elodea densa* for waste removal from a closed culture system.

S. GOTHILF, Israel Institute for Biological Research, Ness-Ziona, Israel. Establishment of the imported parasite *Pentalitomastix plethoricus* (Hym.: Encyrtidae) on *Ectomyelois ceratoniae* (Lep.: Phycitidae) in Israel.

In Israel, *Ectomyelois ceratoniae*, an important fruit pest indigenous to the Mediterranean countries, causes economic damage to carob, grapefruit and almond. *Pentalitomastix plethoricus*, an egg-larval polyembryonic parasite, was imported to Israel from California in 1971. The various procedures employed towards its colonization are described in the present work.

M. SKRZYPCZYNSKA, Institute of Forest Protection, Krakow, Poland. Parasites of insects damaging seeds and cones of the European (*Larix decidua*) and Polish larches (*L. polonica*) in Poland.

From 1968-1976, laboratory and field studies were conducted on the ripening and ripe cones of the European (*Larix decidua*) and Polish (*L. polonica*) larches. The parasites of insects damaging the seeds and cones were identified.