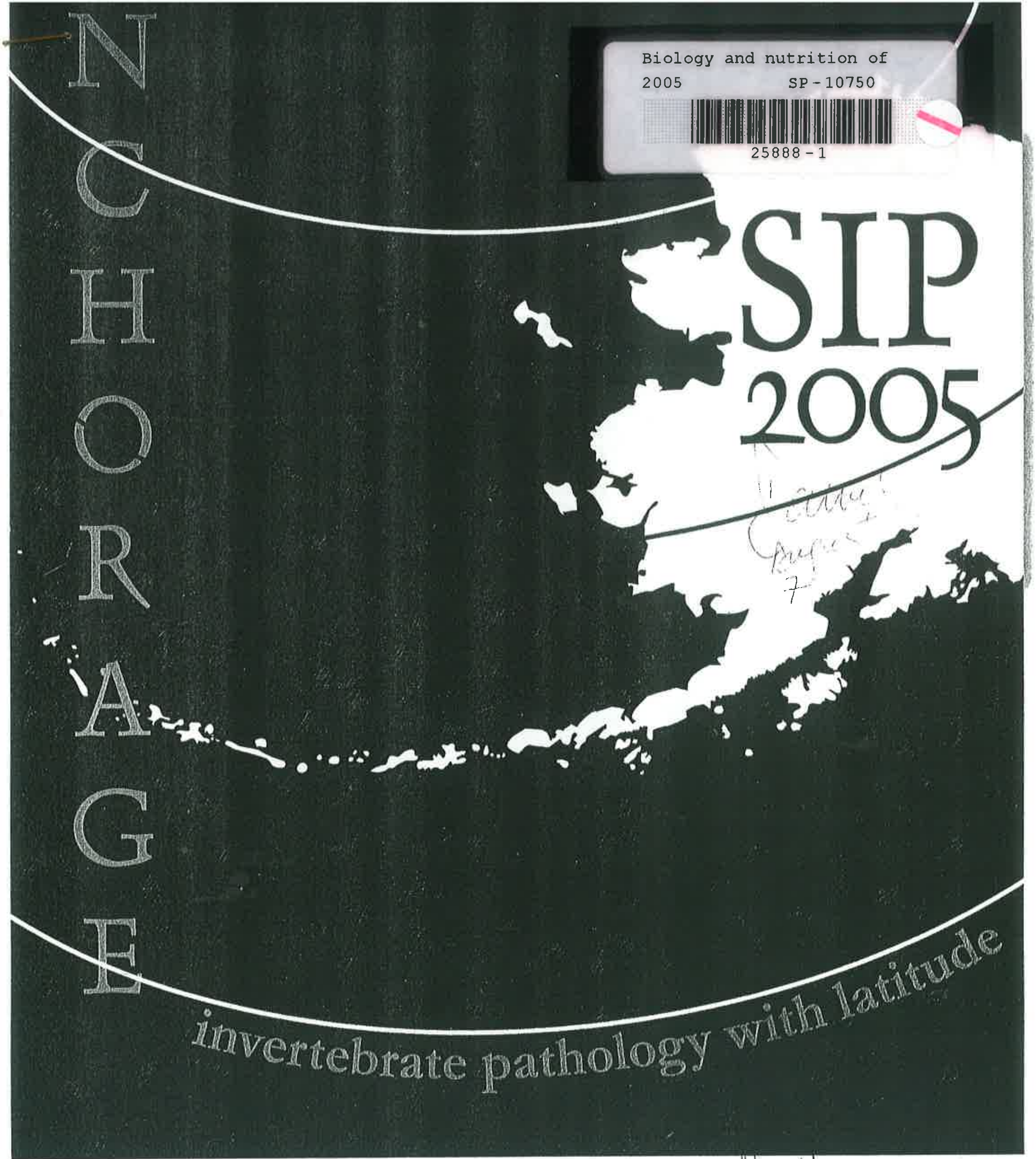


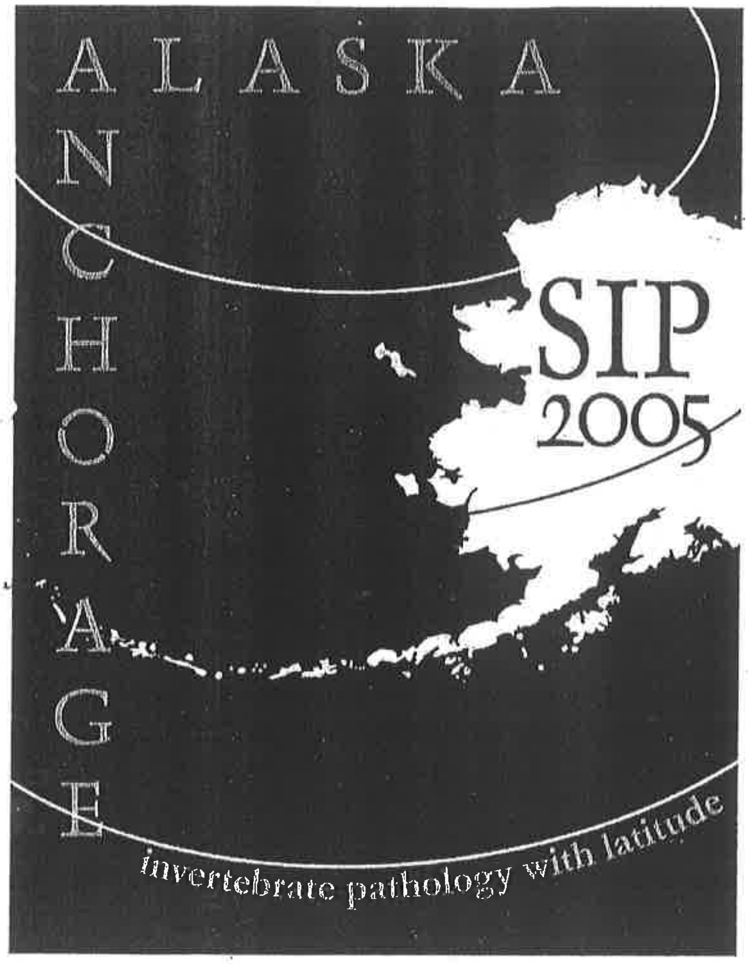
Program and Abstracts for the 38th Annual Meeting

University of Alaska, Anchorage • August 7-11, 2005

Society for

INVERTEBRATE PATHOLOGY

PROGRAM and ABSTRACTS



7-11 August 2005
Anchorage,
Alaska

Poster / Bacteria. B-28.

Light and electron microscope investigations on a rickettsial disease of the subterranean burrower bug, *Cyrtomenus bergi* Froeschner (Hemiptera: Cydnidae)

Regina G. Kleespies

Federal Biological Research Centre for Agriculture and Forestry, Institute for Biological Control, Heinrichstr. 243, 64287 Darmstadt, Germany

The subterranean burrower bug, *Cyrtomenus bergi* Froeschner, is a polyphagous insect pest in different tropical areas. *C. bergi* is reported as a pest of cassava, potatoes, onions, peanuts, maize, sorghum, coffee, sugarcane, and pastures. Little is known about natural antagonists of this pest insect. *C. bergi* was collected in different field sites in Columbia for the establishment of a laboratory culture. Several specimens died in the laboratory and were sent for diagnosis to the Institute for Biological Control of the Federal Biological Research Centre of Agriculture and Forestry in Darmstadt, Germany. Light and electron microscope studies revealed that the death of this insect is caused by a rickettsial disease. Histological sections showed that the fat body is heavily infected and hypertrophied. The oval-shaped rickettsial bodies measure 0.5 x 0.26 µm in size and are located in the cytoplasm of the fat body cells. No associated crystals could be observed. Genetic investigations are planned for closer determination of this rickettsial species that could be of interest in view of biological control measures against *C. bergi*.

Poster / Bacteria. B-29.

Effects of *Bacillus thuringiensis* on the predatory mite *Euseius concordis* (Acari: Phytoseiidae)

Fernando H. Ibanhes and Italo Delalibera Júnior

Department of Entomology, Plant Pathology and Agricultural Zoology, ESALQ - University of São Paulo, C.P.9, 13418-900, Piracicaba-SP, Brazil

Phytoseiid mites are the most important predators of phytophagous mites. Many species of predatory mites feed on spider mites as well as pollens and plant exudates. Due to the external application of *Bacillus thuringiensis* (Bt) based products, cell content feeders such as spider mites, and their predators do not ingest considerable amount of Bt and hence side-effects on these non-target are not expected. The situation is different when predatory mites feed on pollen, plant exudates from Bt plants or spider mites reared on Bt plants because they may also ingest Bt toxins. The information of side effects of Bt toxins on phytoseiid mites is scarce. In this study, we developed a method to assess adverse effects of Bt toxins on phytoseiid mites. The method consisted on stimulating the mites to ingest the test solution by maintaining them in a relatively dry chamber (55-65% RH). The solution tested contained a blue dye (food color additive) to confirm ingestion. This method was validated using the Bt product Dipel WP (0,005 g/ml) on the predatory mite *Euseius concordis*. Ingestion of Dipel decreased adult longevity and oviposition of *E. concordis* compared to the control.

Poster / Bacteria. B-30.

Impact of *Bacillus thuringiensis* Cry toxins on the predator *Chrysoperla carnea* (Neuroptera: Chrysopidae): *In vivo* binding, histopathological and prey-mediated effects

Ana Rodrigo-Simón[1], Carlos Avilla[2], José E. González-Zamora[2] and Juan Ferré[1]

[1]Departamento de Genética, Universidad de Valencia. Dr. Moliner 50, 46100 Burjassot (Valencia), Spain, [2]Departamento de Ciencias Agroforestales, E.U.I.T.A., Universidad de Sevilla. Ctra. Utrera, Km. 1. 41013 Sevilla, Spain

Chrysoperla carnea is an important natural enemy of a wide range of crop pests, that is commonly chosen as a control to determine pesticidal side-effects and the ecological impact of *Bacillus thuringiensis* (Bt) crops. Specific binding of ingested Cry1Ac and cell damage was found in epithelial midgut cells of a susceptible insect, *Helicoverpa armigera*. However neither any histopathological effect of Cry1Ac nor immunodetection of this protein in *C. carnea* was found. The prey-mediated effects of Cry1Ac, Cry1Ab and Cry2Ab on *C. carnea* were studied by feeding them with treated *H. armigera* and *Ephestia kuehniella* eggs. Pupation percentage, proportion of emerged adults and hatching percentage of eggs was no significantly different between treatments. Our results suggest that *H. armigera* fed on Bt crops have not a detrimental effect on *C. carnea* in the field, where the diet is supplemented with other prays like Lepidoptera larvae and eggs, aphids and two spotted mites. We have shown that in the hypothetical case of that Cry1Ac toxin were ingested by *C. carnea*, no binding of this toxin to the midgut of the predator should occur.

Poster / Bacteria. B-31.

Treatment of an *Aedes aegypti* colony during 33 generations with the Cry11Aa toxin of *Bacillus thuringiensis* serovar. *israelensis* results in moderate resistance development

Oscar E. Guevara[1], Abraham Builes[1] and Sergio Orduz[1,2]

[1]Unidad de Biotecnología y Control Biológico, Corporación para Investigaciones Biológicas (CIB), Medellín, Colombia, [2]Facultad de Ciencias Básicas, Universidad de Pamplona, Pamplona, Colombia.

In order to study the possible emergence of resistance, a wild colony of *Aedes aegypti* was subjected to selection pressure with the *B. thuringiensis* serovar. *israelensis* Cry11Aa toxin. This bacterium is the base of the most important biopesticide used in the control of mosquito vectors all over the world. After 33 generations of selection, no significant resistance levels were obtained. Selection experiments started with the Cry11Aa half lethal concentration (LC_{50}) of 26.3 ng/ml and at the generation 33 the LC_{50} was 84.6 ng/ml The highest rate of resistance (RR) found was 3.05, detected when the LC_{50} between treated and untreated colonies were compared in generation 33. Kinetic mortality experiments performed with 500 times the Cry11Aa LC_{50} indicate that the susceptible population died faster than the treated one, and 100% of larval mortality was reached within 330 minutes, while at this same time, 30% of the treated population remained alive. These data indicate that the development of resistance in *A. aegypti* to the *B. thuringiensis* serovar. *israelensis* Cry11Aa toxin might take longer time than in *Culex quinquefasciatus*.

Poster / Bacteria. B-32.

Biology and nutrition of resistant and susceptible populations of *Anticarsia gemmatalis* (Lepidoptera: Noctuidae) to *Bacillus thuringiensis*

Flavio Moscardi[1], Andrea B. Malaguido[2] and Clara B. Hoffmann Campo[1]

[1]Embrapa Soja, C. Postal 231, 86001-970, Londrina, PR, Brazil, [2]Embrapa-Soja/Pronex, Londrina-PR, Brazil

A colony of *Anticarsia gemmatalis* was selected in the laboratory for resistance to *Bacillus thuringiensis* (Bt), through continuous selection pressure by a commercial formulation of Bt (Dipel). This population had a resistance ratio of about 50-fold to Bt, at the time it was compared with the unselected (susceptible) population, regarding biological, nutritional and physiological parameters. Evaluation of larval development and survival, pupal weight and survival, sex ratio, adult reproductive capacity and longevity were based on an initial number of 80 larvae/treatment. For the evaluation of nutritional and physiological parameters, 40 larvae were used plus 20 larvae used as aliquots for the different determinations for each treatment. The main differences between resistant (RP) and susceptible (SP) populations of *A. gemmatalis* occurred for some of the biological parameters evaluated. Mean total larval development time was significantly higher in the RP than in the SP larvae. The sexual ratio of emerged adults (female/male) was 1.34 for SP compared to 0.82 for RP. Mean peak oviposition of the SP occurred in the 5th day (ca. 124 eggs/female) after female emergence, while peak oviposition for the RP occurred in the 6th day (ca. 85 eggs/female) after female emergence. Other biological parameters evaluated were not significantly affected by the treatments. In general the observed biological differences between the RP and the SP could not be explained by the nutritional and physiological parameters evaluated.