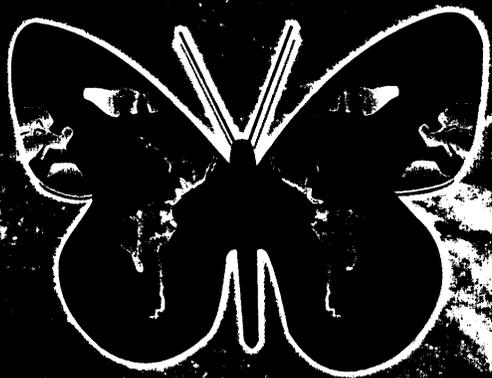


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ABSTRACTS

The International Congress of Entomology is a joint promotion of:

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BOOK II

[3413] UNDESIRABLE EFFECTS OF EXOTIC ANTS ON THE LOCAL FAUNA

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Dozen of ant species are or have been transferred all around the world. Among them, some exhibit a wide success and are referred as "tramp species", including *Linepithema humile*, *Wasmannia auropunctata*, *Pheidole megacephala*, *Anoplolepis gracilipes*, *Paratrechina longicornis*, *Monomorium pharaonis*, *Solenopsis invicta*. Most of the time, they have spread in anthropic habitats, but it is now obvious that they can also invade a wide range of native ecosystems. In these new areas, exotic ants interact strongly with other components of the ecosystems. Formicidae as well as many other groups are affected, including higher trophic levels. Then invaded communities appear to be ruled by tramp ants and they experience major transformations, both from a structural and functional point of view. To illustrate these patterns, we draw a brief review of what has been registered worldwide for the most common tramp ants. We also focus more closely on the example of the spread of *W. auropunctata* onto New Caledonian archipelago (South West Pacific). Main results show that the biotic resistance of invaded communities seems low, while abiotic conditions appear to greatly modulate both invasive and competitive capabilities. Outnumbering (allowed by uniclonality, a common characteristic of most tramp ants) rather than aggressive behaviour may be one of the key of exotic ants' success. If intercontinental comparisons are required to fully understand the mechanisms of exotic ants' invasion, it yet appears that transferred ants, especially tramp species, are a major concern for biodiversity and habitat conservation, in particular in the tropical belt.

Index terms: biological invasion, tramp ants, *Wasmannia auropunctata*, *Linepithema humile*, *Pheidole megacephala*, *Anoplolepis gracilipes*, *Solenopsis invicta*

[3415] DEVELOPMENT AND UTILIZATION OF *ANAPHE INFRACTA*

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Anaphe silkmoths behave as a group in their feeding, molting and movement during their larval stage, and the offspring from a single mother moth collaborate to make a huge silk nest. They belong to Thaumetopoeidae in Notodontoidea. *Anaphe* silkmoth makes a very large silk nest, about 25 X 15 cm in diameter, which contains numerous individuals in a single cocoon. Our interest in this insect is in the following : 1) Are they social insect? 2) How they collaborate to make their silk nest? 3) What are the structural characteristics of the cocoon and cocoon filaments? We will describe preliminary findings on this moth and its silk. An egg mass laid on a leaf is covered with a thick blanket containing scales and silk fibers originating from the moths. Matured larvae collaborate to make a huge silk nest which is composed of a common silk shell and numerous individual cocoons. A special stimulating vapor released from the silk nest causes the skin to itch when touched by the hand. Following degumming of cut nest, we no longer feel this sensation which means that the stimulating chemical is contained in sericin of the cocoon filaments. Each silk filament is extremely flat in cross section and compact, without any fine porous structure. Degumming of a bisected *Anaphe* silk nest was impossible by usual method, and a new method was developed.

Index terms: *Anaphe*, stimulating vapor, silk nest, cocoon filament, degumming method

[3414] THE MICROSPORIUM *VAIRIMORPHA INVICTAE* (MICROSPORIDA: BURENELLIDAE), A POTENTIAL CANDIDATE FOR THE BIOLOGICAL CONTROL OF THE IMPORTED FIRE ANTS IN THE UNITED STATES

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The pathogen *V. invictae* was described by Jouvenaz and Ellis infecting the red imported fire ant, *Solenopsis invicta*, in Brazil. Its effect on fire ants has never been documented, but laboratory observations suggested that dual infections with the pathogen *Thelohania solenopsae* might increase the mortality of the colonies. Surveys were conducted in north-central Argentina to study the abundance of *V. invictae* on native fire ants. Since 1991, a total of 2,287 colonies (*S. invicta*, *S. richteri*, *S. quinquecuspis*, *S. macdonaghi*) was checked in 144 sites of 5 provinces. *V. invictae* was found only in 54 (2.4%) colonies in 18 sites. The highest infestations (23-35%) were found in Recreo-San Justo, Santa Fe Province, in 1999. Intracolony prevalence of *V. invictae* was studied in 12 colonies of *S. invicta*. Individuals of all castes were examined: 315 eggs, 107 larvae, 58 pupae, 303 workers (50 dead individuals), 29 sexuals, and 3 queens. In immature ants, diagnosis of the infection was made by examining fresh Giemsa-stained smears of whole specimens (phase-contrast microscopy 1000x), and in adult ants, by examining whole individuals in aqueous extract for the presence of internal spore masses (phase-contrast microscopy 400x). Meiospores and free spores were quantified in workers and sexuals (n=34) by extracting them in 1 ml of water with a tissue grinder and counting them with a haemocytometer (phase-contrast microscopy 400x). Preliminary results showed that: (1) Both types of spores were present in larvae, pupae, and adult ants (workers, sexuals, and queens), (2) Vegetative stages were present in larvae and pupae, (3) Eggs were apparently uninfected, but the presence of spores in queens suggests that vertical infection might exist, (4) In some colonies, the prevalence of *V. invictae* was 100%, (5) The number of meiospores and free spores ranged from 2.5×10^2 to 5.4×10^3 /ml and from 2.5×10^2 to 6.5×10^4 /ml respectively, (6) In some colonies, 2 weeks after field collection, the prevalence of the infection in workers was reduced to <10%, however, 85% of the dead ants were highly infected. This might be indicating that fire ants infected with *V. invictae* show high mortality rates and reduced longevity. Tests are being conducted to determine the actual detrimental effect of this microorganism on local fire ants.

Index terms: *Solenopsis invicta*, microbial control, intracolony prevalence

[3416] FUNCTION OF WILD COCOONS AND ITS UTILIZATION

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Various insect species spin silk and make a thick cocoon shell to protect their metamorphosis and hatching from various environmental factors, including ultraviolet rays. Those silk spinning insects have also acquired several biologically resistant roles during their long evolutionary history, for example, antibacterial function and a protective effect of ultraviolet rays (UV). We have tested the UV absorption of the cocoons and silk-powder (about 10µm in diameter) of protein type from various insects. As the results we recognized that the cocoons and silk-powder of Bombycidae mainly cut off UV-B, on the other hand cocoons and silk-powder of Saturniidae strongly cut off UV-A and B. Therefore the wild silk materials is vastly superior in cutting UV, differing from various synthetic materials in the developmental process of UV cut commercial goods.

Index terms: cocoon, silk powder, UV cut, Bombycidae, Saturniidae