The Australian Sawfly *Lophyrotoma zonalis*, a Potential Agent for Control of *Melaleuca quinquenervia* in Florida

GARY R. BUCKINGHAM

USDA-ARS, Florida Biocontrol Laboratory,
P.O. Box 147100, Gainesville, Florida 32614-7100, USA

The Australian wetland tree, *Melaleuca quinquenervia*, threatens native ecosystems in southern Florida by forming dense forest monocultures. An extensive grass wetland, the Everglades, is the target of a massive restoration program that might fail if melaleuca and other invading weeds are not controlled. In 1997, an Australian weevil, *Oxyops vitiosa*, was released in southern Florida to destroy the young leaves of *M. quinquenervia*. It is hoped that heavy leaf damage will stunt growth and delay flowering, especially on seedlings and saplings. However, a large proportion of the infestation consists of mature trees over 20 m tall. Mature trees in Queensland, Australia, are sometimes defoliated by the larvae of a pergid sawfly, *Lophyrotoma zonalis*. Host range tests demonstrated that the sawfly is safe to release in Florida, and state and federal permission to do so has been requested. Female sawflies emerge with a full complement of eggs that they insert into the margins of mature leaves. Young instars feed gregariously, but later instars feed individually or in small groups. Older larvae completely devour the leaves. Pupation chambers are made in the soft bark or at the interface with the wood, which damages the trunk and branches. Emerging females mate and crawl upward to the leaves. Although females can fly, they appeared in the greenhouse to be more interested in ovipositing immediately when acceptable leaves were available. In the absence of adapted natural enemies, sawfly populations should increase rapidly, if they establish. Two or three generations a year are expected. Although stressed trees are usually considered the ones most damaged by defoliating insects, damage from the pupation chambers of this sawfly might turn out to be more important than defoliation.

The Planthopper *Megamelus* sp. (Homoptera: Delphacidae), a Promising Candidate for the Biological Control of Water Hyacinth

H. A. CORDO and A. J. SOSA

USDA, ARS, South American Biological Control Laboratory, Agr. Counselor.
ARS Lab., U.S. Embassy Buenos Aires, Unit 4325. APO AA 34034-0001

In 1995, a revived interest for biocontrol of water hyacinth directed investigations to the screening of old candidates and the search for new ones. The need to protect pickerelweed (*Pontederia cordata*) in the U.S. for its ecological values, demands monophagous agents, those that will attack water hyacinth only. For this reason, highly

Proceedings of the X International Symposium on Biological Control of Weeds
4-14 July 1999, Montana State University, Bozeman, Montana, USA
Neal R. Spencer [ed.]. (2000)

damaging candidates have had to be rejected and chances to find monophagous organisms were consequently diminished. Homopterans, in general, had been neglected in the past because of their common trend to polyphagy. However, the planthopper *Megamelus* sp. appears to be specific enough to be safe for pickerelweed. Two species of *Megamelus* have been found associated with water hyacinth and relatives. One attacks most Pontederiaceae but shows a strong preference for *Pontederia cordata*. The second species seems restricted to *Eichhornia crassipes*. The degree of specificity of both species was observed in the field and the laboratory. Here, the insects moved freely between several pools with different Pontederiaceae, making their choices in a quasi natural situation. *Megamelus* so-called *pontederiae* developed on *E. crassipes, E. azurea, P. cordata cordata, P. cordata lancifolia, P. rotundifolia*, and *P. subovata*. The other, *Megamelus* so-called *eichhorniae*, developed only on water hyacinth. Neither variety of pickerelweed (Argentina, U.S., and South Africa), was attacked. This species of *Megamelus* reached very high populations in the laboratory pools despite its eggs being heavily parasitized by two species of Mymaridae and its nymphs and adults by a Drynidae. In the field, frequent predation by Carabidae and Staphylinidae was observed. If devoid of its natural enemies, *Megamelus* sp. seems to have the potential for reaching high populations. Thus, it is considered a very promising candidate for biological control of water hyacinth.

Control of Alismataceae Weeds in Rice using the Mycoherbistat Fungus *Rhynchosporium alismatis*

E. J. COTHER[1], F. G. JAHROMI[2], and G. J. ASH[2]

[1]Cooperative Research Centre for Sustainable Rice Production,
NSW Agriculture, Agricultural Institute, Forest Rd., Orange NSW 2800, Australia
[2]Farrer Centre, Charles Sturt University, Wagga Wagga NSW 2678, Australia

The fungus, *Rhynchosporium alismatis* (Oudem.) J.J. Davis is pathogenic to several weed species in the Alismataceae and is being investigated as a bioherbistat for use in alternative control strategies for management of *Alisma lanceolatum* and *Damasonium minus* in temperate Australian rice crops.

Rhynchosporium alismatis sporulates on a range of solid and liquid media.

Nutrient composition of liquid-shake cultures significantly influenced conidial production after 6 d at 25°C. Lima bean broth at pH 7.5 produced the largest number of viable and infective conidia (4.99 x 10^7/ml). pH, *per se*, did not appear to affect yield directly. The medium in which an isolate was grown had a significant effect on the virulence of the resulting conidia as measured by disease severity scores in leaf discs of *A. lanceolatum* after 3 and 13 d. There was a significant difference between isolates, produced in the same medium, in the subsequent rate of disease development.

Sporulation, germination, and germ-tube length were greatest at 25° and 30°C. Lesion development on leaf tissue was greatest at 25°C but reduced at temperatures > 30°C. Fungal isolate DAR 73158 and lima bean broth are considered to be the combination of choice for further studies to explore the fitness of conidia produced in small-scale biofer-