Biology and distribution of the sugarcane planthopper genus *Eumetopina* (Hemiptera; Auchenorrhyncha; Delphacidae)

BSES Sugarcane for the future

Michael R. Wilson, Entomology Section, Department of Biodiversity & Systematic Biology, National Museums & Galleries of Wales, Cardiff, CF10 3NP, UK.† Email: mike.wilson@nmgw.ac.uk.

Introduction & Origin of sugarcane

Sugarcane, *Saccharum officinarum*, probably originated in Papua New Guinea and Irian Jaya. Several species are native to these countries and there are also many locally selected clones and many of these are grown in household gardens. The introduction of exotic pests and diseases pose major threats to this region as well as to Australia. An ACIAR survey of major diseases and insect pest species has been undertaken in parts of Indonesia and through PNG to Australia's northern coastline.

Insects on sugarcane

"Insect species feeding on sugarcane are diverse, very numerous, and characteristically of limited geographical distribution." (Pemberton & Williams, 1969). Box (1953) listed 1300 species with very few being cosmopolitan. Sugarcane has a very interesting Auchenorrhyncha (Hemiptera) (leafhopper and planthopper) fauna (Wilson, 1987). Among them the planthopper genera *Perkinsiella* and *Eumetopina* are of special significance. *Eumetopina* species are confined to SE Asia (although two African species are currently placed in the genus) and distributed from the pacific islands to Vietnam, but the greatest number of species seem confined to Papua New Guinea, the origin of commercial sugarcane.

Ramu stunt disease

Ramu stunt is the name given to a disease of sugarcane in Papua New Guinea that was first recognised in 1986. Ramu stunt markedly reduces the growth rate of the host; internode distances are reduced and the root system becomes reduced and stunted. (Waller et al., 1987). The disease can kill susceptible varieties. The causal agent seems to be a phytoplasma (Cronje et al., 1999) but *Eumetopina* sp are implicated as vectors (Kuniata et al., 1994)

Genus *Eumetopina*

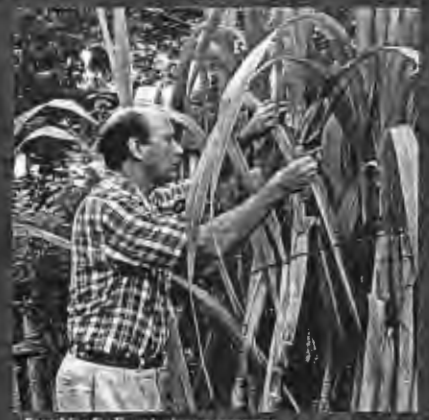
Eumetopina is a small genus of small (3-5 mm) rather elongate, slightly flattened delphacid planthoppers. Characters of the male genitalia define the genus; the anal segment with one process and the thin elongate parameres being among the characters. The adults often have black forewings and thorax but there is considerable variation in the extent of this dark pigmentation. Some species may be recognised easily by markings on the face. (see Figs) Some other species are pale yellow or golden yellow in colour and with only small dark markings. A combination of external features and male genitalia characters are used for species separation.

List of species described

(2 African species omitted) with original locality data

E. bakeri Muir 1919: Borneo
E. bicornis Fennah: PNG
E. caliginosa Muir, 1913: Indonesia
E. flava Muir, 1919: Philippines
E. flavipes Muir, 1913: Papua New Guinea
E. kruegeri Breddin 1896 (type species): Indonesia: Java
E. maculata Muir, 1919: Philippines

Origin of samples of Eumetopina



Searching for Eumetopina on sugarcane

7 Asian *Eumetopina* species have been described, (mostly b Frederick Muir as a result of his visits to the region in the search for biological control agents against sugarcane pests but perhaps another ten species remain undescribed. One species, *E. flavipes* Muir is implicated as a vector of the disease Ramu stunt in PNG and appears quite widely distributed on some Pacific islands. It is also found in Australia at the extreme north of the Cape York Peninsula, on a few isolated plants.

The ACIAR sugarcane survey has provided many new samples of *Eumetopina* for identification and will be used i a taxonomic revision of the genus. In addition a short visit t Indonesia (Kalimantan & Sulawesi Utara) in January 2004 provided samples of 4 *Eumetopina* species

Biology

Eumetopina species appear to live exclusively on sugarcane No other hosts are recorded. Adults and nymphs are found i the growing shoot of the cane. When they are found they may be very common, with hundreds of specimens per plan They may be found by opening the leaf whorl and the insect run readily but not fly. However, they seem invariably long winged ie macropterous; short-winged (ie non flying forms) have not been found. When and how they disperse from one plant to another is interesting since specimens have not beer found at light or in malaise traps. Usually only one species i found on each plant but 2 species have been found together in the same leaf whorl in Sulawesi. Is there any direct competion between species when they occur together?

Associations with ants

Eumetopina are frequently attended by ants of various genera. It does not appear that a special ant genus is consistently involved with the association. The species *Anoplolepis gracilipes Paratrechina* sp., (Formicinae) *Solenopsis geminata*, (Myrmecinae) *Iridomyrmex anceps, Dolichoderus thoracicus*, (Dolichoderinae) have been identified from Sulawesi and PNG. These are opportunistic ants being either scavenger or carnivorous species from several subfamilies. Can *Eumetopina* survive without ants?

References

BOX, H.E. (1953) List of sugarcane insects. London, Commonwealth Institute of Entomology, 101 pages.

CRONJE,C.P.R., BAILEY, R.A., JONES, P., & SUMA, S. (1999) The phytoplasma associated with ramu stunt disease of sugarcane is closely related to the white leaf phytoplasma group. Plant Disease Notes. Plant Disease 83: 588

KUNIATA, L.S., YOUNG, G.R., PAIS, E, JONES, P & NAGARAJA, H. (1994) Preliminary observations on *Eumetopina* sp. (Hemiptera: Delphacidae) as a vector of Ramu Stunt Disease of sugarcane in Papua New Guinea. J. Australian Entomological Society, 33: 185-186.

PEMBERTON C.E. & WILLIAMS, J.R. (1969) Distribution, Origins and Spread of Sugar cane Pests. Pp 1- 9 in Pests of Sugar cane. Elsevier, Amsterdam

WALLER, J.M., EGAN, B.T. & EASTWOOD, D. (1987) Ramu stunt, an important new sugarcane disease in Papua New Guinea. Tropical Pest Management. 33(4) 347-349.

WILSON, M.R. (1987) A faunistic review of Auchenorrhyncha on sugarcane. Proc 6th Auchenorrhyncha Meeting, Turin, pp 485-492.