LEAFHOPPERS (HOMOPTERA: CICADELLIDAE) AND
PLANTHOPPERS (HOMOPTERA: DELPHACIDAE) IN
SOUTHERN FLORIDA RICE FIELDS

R. H. CHERRY AND D. B. JONES
University of Florida, IFAS
Everglades Research and Education Center
P. O. Drawer A
Belle Glade, Florida 33430
AND
F. W. MEAD
Florida Dept. Agric. and Consumer Services
Division of Plant Industry
P. O. Box 1269
Gainesville, Florida 32602

ABSTRACT

Leafhoppers (Homoptera: Cicadellidae) and planthoppers (Homoptera: Delphacidae) were collected with sweep nets in southern Florida rice fields during 1983 and 1984. The most abundant leafhopper was *Grafinella nigripennis* (Forbes) and the most abundant planthopper was *Delphacodes propinquus* (Fieber). Total numbers of leafhoppers in rice fields rose quickly after spring plantings and remained relatively constant from May to October. In contrast, individual leafhopper species were more variable in seasonal population trends. *Sogatodes oryzicola* (Muir), a vector of hoja blanca was also detected.

RESUMEN

Saltas hojas (Homoptera: Cicadellidae) y saltas plantas (Homoptera: Delphacidae) se recogieron con Jabecas en campos arroceros del sur de la Florida durante 1983 y 1984. Se discuten las distintas especies de importancia económica que se encontraron. El saltas hojas más abundante fue el *Grafinella nigripennis* (Forbes) y el saltas plantas más abundante fue el *Delphacodes propinquus* (Fieber). El número total de saltas hojas en los campos arroceros aumentó rápidamente después de las siembras de primavera, manteniéndose relativamente constante de Mayo a Octubre. Sin embargo, las poblaciones de algunas especies de saltas hojas mostraron cambios estacionales dramáticos. También se dectó a *Sogatodes oryzicola* (Muir), un vector dela hoja blanca.

Rice was grown for grain in the Everglades agricultural area of southern Florida during the 1950’s. Commercial production was stopped in 1957 by the United States Federal Government after the hoja blanca (white leaf) disease was found in the area. The lifting of controls on production by the Federal Government in 1974 made it possible again to harvest Florida rice for grain (Alvarez 1978). Since 1977 rice production in the area has grown to nearly 4,000 ha and drying and milling facilities have been established (Rohrmann & Alvarez 1984). Currently, ca. 85% of Florida rice is grown in the Everglades agricultural area.

Several species of leafhoppers and planthoppers are serious pests of rice in different areas of the world and frequently occur in numbers large enough to cause complete drying of the crops. In addition to the damage resulting from direct feeding, leafhoppers and planthoppers are vectors of most presently known rice virus diseases (Pathak 1968). Other than a brief description of leafhoppers and planthoppers in Everglades rice fields
by Genung et al. (1979), little is known of the species composition or seasonal population
dynamics of leafhoppers and planthoppers occurring in Florida rice. In this study, we
describe the relative abundance of leafhoppers (Cicadellidae) and planthoppers (De-
lphacidae) occurring in southern Florida rice fields.

MATERIALS AND METHODS

Eight commercial rice fields in the Everglades agricultural area of southern Florida
were sampled with 38.1-cm-diameter sweep nets each year during the 1983 and 1984
growing seasons. During much of the growing season, these rice fields were kept flooded
and were underlain with soft muck. Sweep nets were thus used because they are light
and portable. Southwood (1978) discusses advantages and limitations of sweep net sam-
pling for insects. Each field was ca. 16 ha and fields were located throughout the
Everglades agricultural area to obtain a representative sample of insect populations.
All fields were subject to normal rice production practices including planting dates that
ranged from March 1 through May 12. Each field was sampled weekly by making 100
consecutive sweeps (180°) taken about 50 meters into the field to avoid possible edge
effects. Sweeping began 6 weeks after planting and continued through harvest. Eight
fields were removed from production after one harvest during August to September
and eight fields were removed from production after one ratoon crop during October to
November. After collection, insects were frozen for later counting. Only adults of the
leafhoppers and planthoppers were counted because of the large number of insects
collected and to facilitate taxonomic identification. An overall survey of the relative
abundance of the leafhopper and planthopper species was determined from 42 random
samples containing 6060 leafhoppers and planthoppers identified by F. W. Mead. There-
after, the-seasonal abundance of the total number of leafhoppers and 3 most abundant
leafhopper species was determined. These latter 3 species were ca. 97% of all leafhop-
pers collected. Delphacid seasonal abundance was not determined because of the low
numbers of these insects collected.

RESULTS AND DISCUSSION

The relative abundance of leafhoppers and planthoppers in sweep net samples in
Florida rice fields is shown in Table 1. Leafhoppers outnumbered planthoppers ca. 41 to
1. Genung et al. (1979) also reported that leafhoppers were more abundant on
Everglades rice than planthoppers. Generally, leafhoppers feed on the leaves and upper
parts of rice plants, whereas planthoppers conline themselves to the basal parts (Pathak
1968). Thus, our sweep net samples probably overestimated leafhoppers relative to
planthoppers present in the rice. The most abundant leafhopper was the blackfaced
leafhopper, Graminella nigrifrons (Forbes). This species has a wide distribution on
grasses in the eastern United States and breeds on rice (Stoner & Gustin 1967). This
species is also a vector of several corn stunting pathogens (Nault & Bradfute 1979). The
second most abundant leafhopper was Draeculacephala portolana Ball which is the most
common Draeculacephala in eastern and central United States and has been reported
in Cuban rice fields (Young & Davidson 1960). Since this insect is common on sugarcane
in the southern United States (Pemberton & Charpentier 1969) and is a recognized
sugarcane pest in Florida (Strayer 1975), some D. portolana probably immigrated into the
rice fields from the numerous sugarcane fields in the Everglades area. Abbott & Ingram
(1942) reported the transmission of chlorotic streak of sugarcane by D. portolana but,
Pemberton & Charpentier (1969) thought that the insect transmission of chlorotic streak
had not been adequately demonstrated in light of more recent studies. The most abun-
dant planthopper was Delphacodes propinquus (Fieber) which is also a vector of maize


<table>
<thead>
<tr>
<th>Cicadellidae</th>
<th>Number</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Graminella nigrifrons</em> (Forbes)</td>
<td>3891</td>
<td>65.8</td>
</tr>
<tr>
<td><em>Draeculacephala portola</em> Ball</td>
<td>988</td>
<td>16.7</td>
</tr>
<tr>
<td><em>Balclutha incisa</em> (Matsumara)</td>
<td>884</td>
<td>14.9</td>
</tr>
<tr>
<td><em>Draeculacephala producta</em> (Walker)</td>
<td>51</td>
<td>0.9</td>
</tr>
<tr>
<td><em>Balclutha hebe</em> Kirkaldy</td>
<td>40</td>
<td>0.7</td>
</tr>
<tr>
<td>Other species*</td>
<td>61</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>5915</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Delphacidae</th>
<th>Number</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Delphacodes propinquus</em> (Fieber)</td>
<td>79</td>
<td>54.5</td>
</tr>
<tr>
<td><em>Perkinsiella saccharicida</em> Kirkaldy</td>
<td>20</td>
<td>13.8</td>
</tr>
<tr>
<td><em>Saccharosyndes saccharivorata</em> (Westwood)</td>
<td>12</td>
<td>3.3</td>
</tr>
<tr>
<td><em>Sogatella koloophon</em> (Bmr.)</td>
<td>12</td>
<td>3.3</td>
</tr>
<tr>
<td><em>Sogatodes molinus</em> Fennah</td>
<td>12</td>
<td>3.3</td>
</tr>
<tr>
<td>Other species*</td>
<td>10</td>
<td>6.9</td>
</tr>
<tr>
<td></td>
<td>145</td>
<td>100.1</td>
</tr>
</tbody>
</table>

*Based on random samples identified by F. W. Mead (see text).
*Delphacodes picella* (Van Thune), *Pissodes pircus Van Thune*, *Sogatodes oryzicola* (Muir).

Rough dwarf virus (Break 1979). The second most abundant planthopper was the sugarcane delphacid, *Perkinsiella saccharicida* Kirkaldy. This species is a serious sugarcane pest of Australian origin. Besides direct damage to sugarcane by feeding and ovipositional activities, the insect is also a vector of the virus that causes Fiji disease in sugarcane. The first North American record of *P. saccharicida* was reported in 1982 in Palm Beach County, Florida. Subsequent surveys revealed the delphacid throughout southern Florida (Sosa 1983). Another delphacid detected in this study is *Sogatodes oryzicola* (Muir). This insect is a vector of hoja blanca which is one of the most destructive rice diseases in the Western Hemisphere (Harris 1979). Fortunately, hoja blanca currently is not known to exist in the United States. Detection of *S. oryzicola* in this study is the first report of the insect in the United States in more than a decade.

The seasonal population trends of leafhoppers in the sweep net samples are shown in Fig. 1. Total numbers of leafhoppers rose quickly in April and remained relatively constant (Range = 44 to 78 adults/100 sweeps) from May until October, decreasing to 26 adults/100 sweeps in November. In contrast to the total leafhopper numbers, the 3 most abundant leafhopper species showed more variable seasonal trends. The early increase of leafhoppers in rice fields during April and May was almost wholly (> 97%) due to *G. nigrifrons*. During June to August, *G. nigrifrons* remained > 75% of all leafhoppers, and then declined to lower levels during September to November. Gernung & Mead (1960) also found a decline in *G. nigrifrons* populations after August in pasture grasses in southern Florida. *D. portola* populations increased slowly during April to June and remained somewhat constant (Range = 8 to 28 adults/100 sweeps) thereafter. In contrast to *G. nigrifrons* or *D. portola*, *Balclutha incisa* (Matsumara) increased rapidly during the late summer to fall period and during October was the most abundant leafhopper species. Reasons for this October increase in *B. incisa* are not known, but
Fig. 1. Mean adult leafhoppers per 100 sweeps in eight Florida rice fields sampled each year during 1983 and 1984. Each field was sampled weekly with 100 continuous 180° sweeps with a 38.1 cm diameter sweep net. Fields were located throughout the Everglades agricultural area of southern Florida.

may be related to the weedy condition of a few of the ratoon rice fields.

In conclusion, Genung et al. (1979) have noted that leafhoppers are often very abundant on southern Florida rice and may contribute to the unthrifty appearance and discoloration often observed in the rice. Currently, southern Florida rice growers have expressed no concern for leafhopper or planthopper populations in their rice fields and S. orizicolia was the only rice disease vector detected in our survey. However, several economically important leafhopper and planthopper species including potential disease vectors are present in the fields and may increase rapidly in numbers. Presently, we have little understanding of the impact of leafhoppers and planthoppers on southern Florida rice production or how these insects are interacting with other local crops such as corn and sugarcane. These above subjects warrant future research, especially if rice acreage continues to increase in southern Florida.

ACKNOWLEDGMENTS

We express our gratitude to the numerous rice growers who allowed us use of their fields and Dr. J. P. Kramer for help in identifying some specimens and Dr. J. Alvarez for the Spanish translation. This is Agricultural Experiment Station Journal Series No. 6376 and FDACS, DPI, Bur. Entomology Contribution No. 610.

REFERENCES CITED

ARROTT, F. V., AND J. W. INGRAM. 1942. Transmission of chlorotic streak of sugar
cane by the leaf hopper *Drosculacephala portola*. Phytopathology 32: 99-100


---

**ARTHROPODS ON BRAZILIAN PEPPERTREE, SCHINUS TEREBINTHIFOLIUS (ANACARDIACEAE), IN SOUTH FLORIDA**

**J. R. CASSANI**

Lee County Hyacinth Control District

Post Office Box 06006

Fort Myers, Florida 33906

**ABSTRACT**

Arthropods on *Schinus terebinthifolius* Raddi were collected by hand and with a sweep net every other week between 8 May 1979 and 29 July 1980 at three sites in Lee County, Florida. Of the 115 arthropod species identified, 46 (40.0%) were phytophagous, 59 (51.3%) predatory, and 10 (8.7%) miscellaneous. The six most frequently occurring species belonged to either the Formicidae or Araneae. The most frequently (65.5%) occurring phytophagous sp. was a bush cricket (*Cyrtocriza sp.*). The phytophagous