Research Note

DAMAGE TO RICE SEEDLINGS BY HORTENSIA SIMILIS *AND* DRAECULACEPHALA SOLUTA *IN COLOMBIA*[1]

In Colombia, two Cicadellidae, *Hortensia similis* Walker and *Draeculacephala soluta* Gibson, are persistent insects in rice fields[2]. Although neither insect has economic importance, farmers use insecticides to control both species, which can reach high population densities. In addition, both species have been associated with the Rice Hoja Blanca Virus (RHBV),[3] but under controlled conditions neither species is capable of transmitting RHBV, even to susceptible varieties.

In this study we report on the survival of these two insects in varieties with known resistance to another important rice pest, *Tagosodes orizicolus* (Muir). The study also presents tests for RHBV acquisition and transmission ability of these two pests.

Fifteen-day -old individual rice plants were confined in 30 x 15 cm organdy cloth cages and infested with 20 insects per plant. Insects were allowed to feed and plants were rated for mechanical damage when Bluebonnet 50 (Bbt 50) showed 50% dead plants. Bbt 50 is a variety with known susceptible reaction to Homopterae feeding damage.[4] Six varieties were tested. The varieties selected were known to be resistant to *T. oryzicolus*, which causes similar damage. Adults were removed five days after the infestation. Nymphs were allowed to hatch, then counted and removed from the plants. The procedure was repeated daily for 15 days or until no more nymphs were obtained.

In a separate test, the two insect species were compared as to their feeding behavior on Bbt-50. Excreta was collected from 50 individual insects confined in parafilm sackets placed on the stem and the foliage. Insect feeding activity was compared on the basis of the excreta collected by following the method of Pagua and Pathak 1980.[5]

In a separate study, 100 insects of each species were examined for their RHBV acquisition and transmission ability. Insects were allowed to feed on infected Bbt-50 plants for 5 days. All plants used had visible RHBV symptoms. Insects were then individually transferred to healthy 15-day-old Bbt-50 plants and observed until all insects died. Excreta was collected and tested with ELISA[4,5]. Plants were inspected for RHBV symptoms. Dead insects were also tested by using the ELISA technique[4]. *T. oryzicolus* was used as control.

The statistical analysis indicates significant (P=0.05) differences in species and varieties, but no significant species x variety interaction, suggesting that all varieties tested presented similar damage response to both insects. Bbt-50 presented the highest mechanical damage rating for both insect species (Table 1). *D. soluta* was more damaging than *H. similis*, but more

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[2]Arcineagas, I.C., 1991. Determinación del umbral de acción de *Hortensia similis* Walker y *Draeculacephala soluta* Gibson (Homoptera: Cicadellidae) en el cultivo del arroz, *Oryza sativa* L. en el Valle del Cauca, Colombia. Bs. Tesis, Universidad Nacional de Colombia, Palmira, Colombia.

[3]Grist, D.H. and R.J. Lever., 1969. Pests of Rice. Longmans, London.

[4]Zeigler, R.S. and F.J. Morales, 1990. Genetic determination of replications of rice hoja blanca virus within its planthopper vector, *Sogatodes oryzicola*, *Phytopathology* 80:559-566.

TABLE 1.—*Mechanical damage and number of nymphs (± SEM) on six rice cultivars for* Hortensia similis (H.S.) *and* Draeculacephala soluta (D.S.).

Cultivar	Mechanical damage			Number of Nymphs		
	H.S.	D.S.	Mean	H.S.	D.S.	Mean
Bbt 50	3.6±6.7	6.4±.90	5.0±63 A	5.7±1.7	2.3±1.1	4.0±1.1 B
IRAT 120	2.8±.20	4.4±1.1	3.6±.56 B	6.8±1.9	2.2±1.1	4.5±1.2 AB
IRAT 121	3.0±0.0	4.0±1.0	3.5±.50 B	10.3±2.4	3.2±1.0	6.8±1.5 AB
IRAT 122	2.8±.20	3.8±.61	3.3±.33 B	12.0±2.3	8.6±3.2	10.3±2.0 AB
IRAT 124	2.4±.31	4.0±.68	3.2±.41 B	15.3±2.5	8.1±3.9	11.7±2.4 A
MUDGO	3.2±.75	4.2±.90	3.7±.59 AB	13.2±4.6	4.6±1.6	8.9±2.5 Ab
MEAN	3.0±.18	4.5±.36		10.6±1.2	4.8±.96	
P > F*	0.05			0.05		

Mechanical damage on 0-9 scale: 0=no damage, 9=all plants death.
*Mean comparison of *H.S.* versus *D.S.*

Table 2.—Comparison of Draeculacephala soluta *and* Hortensia similis *feeding behavior on Bluebonnet 50.*

Species	Excrete volume (ml) ± SEM	
	Stem	Foliage
D. soluta	11.33 ± 2.5	5.8 ± 1.8
H. similis	4.50 ± 1.3	3.5 ± 2.6
P > T	0.0316	0.5110

nymphs, were recovered from *H. similis* infected plants than from plants exposed to *D. soluta*. The larger size of *D. soluta* may be responsible for the higher damage rate observed. *D. soluta* produced almost three times more excreta volume than *H. similis* (table 2).

Probably the higher damage rate caused by *D. soluta*, desiccated plants earlier therefore diminishing oviposition; therefore fewer nymphs were recovered. This theory needs additional studies in as much as there is little information on oviposition on rice plants for either species. The low number of nymphs on Bbt-50 also suggests that mechanical damage affected oviposition. For both insect species, cultivars with a low damage rating, as IRAT 124, displayed high nymphal counts.

All insects tested with ELISA were negative for RHBV. Similarly, insect excretion was negative for RHRV. Neither species was capable of transmitting RHBV to susceptible Bbt-50 seedlings, whereas the control colony of *T. orizicolus* gave positive RHBV transmission.

The results of our tests indicate that *D. soluta* is more damaging to rice seeding than *H. similis*. Bbt-50, a variety used as susceptible check for screening *T. orizicolus* resistance[6], was also susceptible to both species. The higher damage rating by *D. soluta* is associated with insect size. Neither species was capable of acquiring or transmitting the RHBV. These results do not agree with reports by Grist[5], suggesting that these two species are vectors of RHBV. Field and laboratory observations (Pineda and Pantoja, unpublished data) indicate no evidence that either species is capable of acquiring or transmitting the virus. These unpublished data confirm the findings reported in the present work.

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[5]Pagua, P., M.D. Pathak and E.A. Aeinrichs, 1980. Honeydew excretion measurement techniques for determining feeding activity of biotypes of *Nilaparvata lugens* on rice varieties. *J. Econ. Entomol.* 73:35-40.

[6]Jennings, P.R. and A. Pineda, 1971. Screening rice for resistance to the planthopper, *Sogatodes oryzicola* (Muir). Crop Science 10:687-698.

[7]Al presente con el Departamento de Protección de Cultivos.