

## Research Note

### DISTRIBUTION OF ADULT DIAPREPES ABBREVIATUS L. (COLEOPTERA: CURCULIONIDAE) IN THE NORTH AND NORTHWEST SUGARCANE AREAS OF PUERTO RICO<sup>1</sup>

The sugarcane rootstalk borer weevil, *Diaprepes abbreviatus* L., is considered a pest in all the Caribbean region and Florida.<sup>2</sup> In Puerto Rico it is considered a major pest of sugarcane, citrus, yams, and ornamentals. Although the adult also feeds on the foliage of about 77 host plants.<sup>3</sup> The injury caused by the larvae (eating the small roots and making a tunnel in the principal root) is usually more important than that caused by the adult.<sup>4,5,6</sup> The life cycle of *D. abbreviatus* is normally completed in a year.<sup>4</sup> Emerging adults are generally more abundant late in the spring (April) and in the summer (August). The purpose of this investigation was to determine the distribution of adults of *D. abbreviatus* in sugarcane fields, with the hope of determining the number of insects per area and proposing an estimate of the potential damage. The study was conducted from June to March 1980 at Aguada (Central Coloso), Isabela (Agricultural Research and Development Center), and Arecibo (Central Cambalache) sugarcane growing areas of Puerto Rico. At each locality 10 rectangular areas 50 m long by 5 m wide were selected. The greatest distance was always parallel to the edge of the fields studied. These areas were selected because previous observations

suggested that adult weevils congregate in weeds around the edge of the plantations. Adults were hand-picked on line transects. Every plant in each experimental area was inspected and all adults were collected. The captures were made from 9:00 am to 12:00 pm.

In the Aguada survey, 233 adults in a total area of 2,500 m<sup>2</sup> were collected in June 1980 (table 1). The population gradually diminished and by January 1981 no adults were captured. Host plants where the adults were collected in Aguada were *Panicum maximum* Jacq. (Guinea grass); *Saccharum officinarum* L. (sugarcane); *Amaranthus spinosus* L. (spiny amaranth); *Malachra* spp. ("malva"); and *Aeschynomene americana* L. ("morivivi bobo"). *Aeschynomene americana* always had the greatest number of adult weevils per plant.

At Isabela, only 332 adults were captured for the whole season (table 2). Contrary to what we observed at Aguada, the weevil population at Isabela was low in June 1980. A decreasing population pattern was observed until September 1980. By October 1980, the number of adults was very high (257 insects). From then on, the population decreased. In December no adults were

<sup>1</sup>Manuscript submitted to Editorial Board 12 December 1986.

<sup>2</sup>Woodruff, R. E., 1964. A Puerto Rico weevil new to the United States (Coleoptera: Curculionidae). Fla. Dep. Agric., Division of Plant Industries. Entomol. Circ. 30: 1-2.

<sup>3</sup>Martorell, L. F., 1976. Annotated food plant catalog of the insects of Puerto Rico. Agric. Exp. Stn., Univ. P. R.

<sup>4</sup>Wolcott, G. N., 1936. The life history of *Diaprepes abbreviatus* L. at Río Piedras, P. R. *J. Agric. Univ. P. R.*, 20 (4): 385-914.

<sup>5</sup>Wolcott, G. N., 1948. The insects of Puerto Rico. *J. Agric. Univ. P. R.* 32 (2): 385-416.

<sup>6</sup>Wolcott, G. N., 1955. Entomología económica puertorriqueña. Univ. P. R., Esta. Exp. Agric. Bol. 125: 1-208.

TABLE 1.—*Captures of sugarcane weevil adults, Diaprepes abbreviatus L., in the Aguada area, P. R. (June 1980–January 1981)*<sup>1</sup>

Collection dates	Female	Males	No. of insects
June 1980	145	138	283
July 1980	42	31	73
Sept. 1980	72	61	133
Oct. 1980	51	59	110
Nov. 1980	31	20	51
Dec. 1980	0	0	0
Jan. 1981	0	0	0
TOTAL	361	289	650

<sup>1</sup>Insects sampled in 10 randomly selected plots (50 m × 5 m).

TABLE 2.—*Captures of sugarcane weevil adults, Diaprepes abbreviatus L., in the Isabela area, P. R. (June 1980–December 1980)*<sup>1</sup>

Collection dates	Female	Males	No. of insects
June 1980	12	8	20
Sept. 1980	4	6	10
Oct. 1980	153	104	257
Nov. 1980	28	17	45
Dec. 1980	0	0	0
TOTAL	194	138	332

<sup>1</sup>Insects sampled in 10 randomly selected plots (50 m × 5 m).

TABLE 3.—*Captures of sugarcane weevil adults, Diaprepes abbreviatus L., in the Arecibo area, P. R. (June 1980–March 1981)*<sup>1</sup>

Collection dates	Female	Males	No. of insects
June 1980	218	342	560
Oct. 1980	276	263	539
Jan. 1980	46	59	105
March 1981	38	22	60
TOTAL	578	686	1264

<sup>1</sup>Insects sampled in 10 randomly selected plots (50 m × 5 m).

found. More than 60% of adults collected at Isabela were obtained in the last 2 weeks of October 1980. The host plant with the greatest number of adult weevils in this locality was pigeon pea, *Cajanus cajan* L. Millsp.

At Arecibo, the population of *D. abbreviatus* did not exhibit short periods of high abundance (table 3). The number of adult weevils remained high for June and October. The weevil population probably decreased after October 1980, behaving as the Isabela and Aguada populations but not

so dramatically. Most of the insects were found in *A. americana* and *Malachra* spp.

The results indicate that for the months studied, the weevil populations at Aguada and Isabela increase within short periods, and afterwards almost no adults can be found. At Arecibo, adults were abundant during the whole season but decreased during the winter season as in other localities.

In Aguada and Arecibo, *D. abbreviatus* preferred the host plants *A. americana* and *Malachra* spp. Greatest host abundance

usually coincided with the greatest number of weevils. It was observed that almost all weevil activities, such as copulation and feeding were confined to these host plants. At Isabela, the same host preference pattern and abundance was observed; the preferred host plant in this locality was pigeon pea. The largest number of adult weevils was recorded for October, when the crop was growing vigorously. After the rains of September and October 1980, the weevil population increased rapidly.

Some doubt exists whether the number of weevils obtained justifies that *D. abbreviatus* be considered a pest. For example, in the Arecibo locality, the average number of female weevils was 96.3 per 2,500 m<sup>2</sup>. If each female oviposits during its lifetime a maximum of 5,000 eggs,<sup>4</sup> we calculate the presence of up to 481,000 eggs per 2,500 m<sup>2</sup>. We obtained an average of 30% eclosion for egg masses obtained in the laboratory in various experiments (unpub-

lished data). Given this survival rate, it is estimated that 144,450 first instar larvae per 2,500 m<sup>2</sup> could be found. Since the larva is the stage that causes economic injury to sugarcane plants these high numbers could justify *D. abbreviatus* being considered a major pest.

In conclusion, the three localities have in common a preferred host with adults rarely found on sugarcane. The decrease in weevil abundance for all localities in December coincides with the usual 1-year life cycle reported for this pest.<sup>4,5,7,8</sup> Apparently, *D. abbreviatus* has one generation per year; however, adults could be found emerging throughout the year. Other research<sup>5</sup> shows that overlapping generations allow two weevil population peaks: in April and in October.

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<sup>4</sup>Wolcott, G. N., 1936. An economic entomology of the West Indies. Entomological Society of Puerto Rico, San Juan, P. R. Richard Clay and Sons, Ltd., Great Britain. pp. 133-42.

<sup>5</sup>Jones, T. H., 1915. The sugarcane weevil root borer (*Diaprepes spengleri* L.) Insular Exp. Stn., Río Piedras, P. R. Bull. 14: 7-19.