SEXUAL ATTRACTION OF THE FEMALE HESSIAN FLY* (PHYTOPIHAGA DESTRUCTOR SAY)

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An accidental observation on April 2, 1921, at Centralia, Illinois, prompted a short study of the field activity of the male Hessian fly. On this date a female fly, emerging from a flaxseed partially covered by mud, became entangled and stuck, but was not so hidden as to evade the courtship of a number of male flies. A miniature swarm attended the female. Three and four males made offers of copulation at the same time while others stood facing the female or walking and flying impetuously about until an opportunity came to replace the ones in closer touch with her.

Following the clue given by the helpless female fly, several small cylindrical cages one inch in diameter and three inches tall were stocked with newly emerged females of known age, care being taken to obtain individuals which were still soft, uncolored, and unfertilized. Five females were imprisoned in each cage and the cages placed on the surface of the ground in the field as desired.

OBSERVATION I.

Five cages containing females were placed in the field. Over each cage was placed a larger wire cage three inches in diameter and ten inches tall painted with tanglefoot. These cages were placed at 9 a. m., April 2, and the males excited by the presence of the females, were caught, counted and removed as shown in Table 1. The females were left undisturbed until the males failed to be attracted. On April 4 only one female fly was alive in each cage and the following day all were dead.

TABLE 1.

Date	Hour	Cage 1	Cage 2	Cage 3	Cage 4	Cage 5	Total
Apr. 2	10 a. m.	43	159	43	99	86	430
	11 a. m.	50	103	51	60	138	402
	4 p. m.	42	91	80	39	20	272
Apr. 3	9 a. m.	190	140	240	145	87	802
	11 a. m.	142	81	126	109	43	501
	4 p. m.	11	15	12	32	10	80
Apr. 4	9 a. m.	57	126	118	169	80	550
	11 a. m.	46	61	56	40	18	221
	4 p. m.	9	8	29	6	3	55
Apr. 5	9 a. m.	93	32	17	47	45	234
	11 a. m.	0	0	0	0	0	0
	4 p. m.	0	0	0	0	0	0
Apr. 6	9 a. m.	24	15	5	17	3	64
	11 a. m.	0	0	0	0	0	0
	4 p. m.	1	0	0	1	3	5
Apr. 7	9 a. m.	0	1	1	1	8	11
	11 a. m.	0	0	0	0	0	0
	4 p. m.	0	0	0	0	0	0
Total		708	832	778	765	554	3627

The results show that an average of 145 males were attracted for each of the 25 females confined. In the case of the five females in Cage 2, a maximum average of 166 males per female was obtained and in Cage 5 a minimum average

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of 109 males per female was obtained. It was noted during the observation that the males advanced against the wind and the advance was made slowly from a general assembly area a short distance from the females. The attraction to all cages continued even after all females were dead. The greatest number of males were caught on the cages just above the ground surface, thence upward for three inches. The activity of the males was most manifest early in the morning.

OBSERVATION 2.

To determine the area of attraction and the limits of the zone of advance or assembly, three cages, numbered 1, 2, and 3, were placed in the field in separated places. Concentric circles were marked around all the cages with radii one to fifteen feet. The leeward arcs of ninety degrees were the observational limits of cages 1 and 2. For cage 1 the arcs were set with screen wire painted with tanglefoot and for cage 2 set with tanglefoot painted in one inch strips on the ground. For cage 3 the concentric circles were used for points of position only, the observations being centered on the side of the sector set with tanglefoot screens enclosing an arc of forty-five degrees on the leeward side of the cage. The observation started at 10 a. m., April 3, and ended the same day at 3 p. m. The number of males caught in the tanglefoot at one foot intervals from one to fifteen feet, is shown in Table 2.

TABLE 2.

Distance	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
Cage 1	35	15	2	4	18	12	3	0	0	0	0	0	0	0	0	89
Cage 2	35	25	37	26	42	40	10	9	4	2	7	5	3	1	0	246
Cage 3	87	116	18	15	10	4	4	8	7	1	0	0	0	0	0	270
Males caught--																
Total	175	156	57	45	70	56	17	17	11	3	7	5	3	1	0	605

Males within fifteen feet of the females were apparently attracted and definitely so within ten feet. The zone of assembly was particularly outlined from one to six feet from the females.

During the time the cages were run in both observations the wind was in a constant south and south-west direction with a velocity of six to eight miles per hour and a maximum not over twelve. Fly emergence in the field was at its maximum intensity for the season and the weather clear and warm.

A NEW PARASITE OF THE SPRUCE BUDWORM (HYM).

BY S. A. ROZIER,

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The following description of a new species of *Phytodietus*, reared by Mr. A. B. Baird as a parasite of the spruce budworm, is presented at this time so the name may be used in a forthcoming paper dealing with this moth.

***Phytodietus fumiferanae* new species**

Allied to *Phytodietus annulatus* (Provancher) from which it may be distinguished by longer postocellar line, dark hind legs and different colored coxae of the male.

Female.—Length, 8 mm.; length of antenna, 8.5 mm.; length of ovipositor beyond abdomen, 3.5 mm. Slender; clypeus depressed medianly along anterior