

Diptera Populations in the Whitewater Valley

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As part of an insect survey conducted under the Earlham College soil research program, we are attempting to discover whether or not relationships exist between insects and soil types of the Whitewater Valley. This report is the result of collections made from June 6 to August 12, 1960, on the Genessee silt loam of streams of the northern half of the White-water drainage basin.

Field collections from 14 localities yielded 1,835 pinned Diptera, the insect order with which this report is concerned. Collecting was by sweeping with 15" diameter nets and collecting some individual insects by hand. Collecting was limited to within approximately 50 feet of the stream, on each bank, and sweepings were made in all vegetational habitats within this area. Identifications were made with a Spencer binocular microscope with powers ranging from 7x to 80x. Borror and DeLong (1) was used for family identifications and Curran (2) was used for classification to genus of some specimens.

Survey Sites

All of the survey sites were in pastures and woods of different types. For example, some of the pastures were inhabited by cows, horses, sheep or hogs; some were abandoned; others were combinations of woods and pasture. There was very little cropland close to the streams. The natural environment along these streams is woodland. Here the soil holds a great quantity of water, and decaying vegetation is abundant. Tree holes and intermittent streams provide moist spots where many Diptera breed. An example of the effect of these moisture factors can be seen in the abundance of moisture-loving plants such as poison hemlock and jewelweed. Because of the additional moisture which the stream gives to this woodland, we have termed this the "moist woods-stream" habitat.

Results

The moist woods-stream habitat is particularly favorable to a great quantity and variety of Diptera. Table 1 shows the numbers of each family of Diptera collected at each locality.

A similar table drawn up for the previous summer's collecting shows similar results. In 1959, at 12 collecting sites in the upper Whitewater Valley, the same 36 families of Diptera were collected plus an additional four families: namely, Dixidae, Rhyphidae, Mydidae, and Lonchopteridae. The first three families were represented by one specimen respectively. There were 12 specimens collected of the last family. Families such as Dolichopodidae and Ephydriidae were collected in abundance both summers, while Mycetophilidae and Therevidae were not taken in quantity either season.

In studying a narrow strip of stream bank, the fluctuation of the dipteran and other insect populations between habitats must be recognized.

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TABLE 1

Number of Dipteran Families Collected at Whitewater Valley Localities

	Webster	Fountain City	Centerville	Williamsburg	Green Township	Dalton	Centerville S. W.	Greensfork	East Germantown	Beeson	Richmond S. E.	Economy S.	Modoc	Jacksonburg
Tipulidae	12	6	16	30	18	7	11	2	5	20	6	5	12	5
Chironomidae	11	12	1	2	—	9	2	—	3	1	—	—	4	2
Ceratopogonidae	—	2	3	—	—	5	1	4	9	3	1	4	6	2
Culicidae	1	—	1	1	1	—	—	—	13	1	2	2	8	2
Mycetophilidae	—	1	—	—	—	—	—	1	1	—	—	—	—	1
Sciariidae	—	1	2	1	1	2	1	—	—	—	—	—	—	1
Stratiomyidae	2	2	1	1	—	1	8	3	4	1	4	3	3	1
Rhagionidae	6	5	7	4	18	6	8	—	5	3	4	4	10	1
Tabanidae	1	2	3	3	—	7	7	—	5	3	—	—	7	7
Therevidae	—	—	—	—	—	—	1	—	—	1	—	—	—	—
Bombyliidae	—	—	—	—	—	—	—	—	—	1	—	4	—	—
Asilidae	—	2	2	—	—	—	3	1	—	4	—	—	8	7
Empididae	4	7	1	1	9	7	3	—	6	1	7	2	11	1
Dolichopodidae	11	9	17	8	12	21	19	7	10	13	23	17	20	17
Phoridae	—	—	—	—	—	—	—	—	1	—	—	—	—	—
Pipunculidae	2	—	—	—	—	—	7	—	—	—	—	—	1	—
Syrphidae	6	12	28	12	2	28	12	15	9	8	14	17	10	17
Conopidae	3	—	4	2	1	—	—	—	—	5	—	2	—	2
Otitidae	7	3	2	1	—	4	7	—	1	3	3	2	1	5
Trypetidae	4	3	2	—	1	2	3	1	—	4	4	4	1	1
Lauxaniidae	4	5	7	11	2	13	5	15	6	8	4	8	15	6
Sepsidae	9	4	12	7	—	6	3	22	2	6	10	11	11	1
Sciomyzidae	—	5	1	1	—	8	—	5	—	1	13	5	7	6
Heleomyzidae	—	—	—	—	—	—	—	—	1	—	—	—	—	—
Psilidae	2	—	—	3	—	—	2	—	—	—	—	—	—	—
Agromyzidae	1	—	—	—	—	1	—	—	—	2	1	—	—	—
Drosophilidae	—	—	3	—	—	—	—	—	—	—	—	—	1	—
Ephydriidae	6	12	17	12	5	27	8	10	11	12	13	4	11	2
Chloropidae	—	6	6	—	1	10	3	12	6	2	6	7	10	4
Sphaeroceridae	—	1	2	1	—	4	1	2	2	6	2	1	1	—
Tachinidae	1	—	2	5	1	1	2	2	1	1	5	4	3	4
Calliphoridae	—	1	2	5	1	2	—	1	—	—	3	3	—	3
Sarcophagidae	—	3	3	4	1	3	10	—	3	1	7	5	2	24
Muscidae	2	5	2	1	—	9	4	7	—	1	2	3	5	1
Anthomyiidae	2	4	15	2	1	7	3	12	1	1	4	3	14	7
Scopeumatidae	—	—	1	—	—	—	—	1	—	—	—	—	1	—

This is seen in the case of the Therevidae, which generally prefer an open area, but come to decaying vegetation to lay eggs. The Conopidae and

Pipunculidae may be accidentally present in the moist woods-stream habitat; because of the parasitic habit of their larvae, they would be found where their hosts were.

Further collecting might fill in many of the blanks in Table 1. The figures are significant in that they show that a family was present at a certain locality, and in relative scarcity or abundance.

Summary

Field collections at 14 localities along streams of the Whitewater Valley showed the presence of 36 families of Diptera. Families present at all localities were Tipulidae, Dolichopodidae, Syrphidae, Lauxaniidae, Ephydriidae, and Anthomyiidae. Present in all but one locality were Stratiomyidae, Rhagionidae, Empididae, Sepsidae, and Tachinidae.

Literature Cited

1. BORROR, D. J. and D. M. DELONG. 1955. An Introduction to the Study of Insects. Rinehart and Co., N. Y.
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