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## The Horn-Fly

Howard Evarts Weed

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THE HORN-FLY.

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HOWARD EVARTS WEED.

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AGRICULTURAL COLLEGE, MISS.

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# THE HORN-FLY.

(*Hæmatobia serrata* ROBINRAU-DESVOIDY.)

The Horn-fly is a European cattle pest which first appeared in this country in New Jersey in 1887, and is supposed to have been brought from southern France, where it has been a well known pest since 1830. From New Jersey its spread southward and westward has been very rapid. In 1889 and 1890 it was very abundant in New Jersey, Maryland, and Virginia, and in 1891 had reached Ohio and Kentucky. In the latter year it made its first appearance in eastern Mississippi, being first reported by Mr A. H. Bush of Macon, and at about the same time it was noticed among the cattle at the A. & M. College. By the end of 1892 it became very generally distributed throughout the state, and in 1893 it was so very abundant that it attracted general attention. Being a native of a rather warm climate, it is more apt to thrive in the southern than in the northern states. During the past two years it has not been abundant in New Jersey, where it first appeared; with us, however, it will probably remain a permanent pest, although not as numerous as at present, for in the economy of Nature doubtless its numbers will be lessened through the action of parasites.

The Horn-fly was first studied in this country by Profs. Riley, Howard, and Smith, and it is to the writings of these gentlemen that we owe much of our knowledge of its life history.

## DESCRIPTION.

The Horn-fly is shown at *d* in Fig. 1, and is about one-fifth inch in length, and of a dark gray color. It is much smaller than the common house fly and is readily distinguished from the common cattle fly by being slightly smaller, more elongate, and somewhat darker. The large dark-brown compound eyes,

as seen in Fig. 2, occupy a very large part of the head. In the male, shown at *b*, the eyes come closer together than in the female shown at *a*. Surrounding the eyes the head is silvery gray. The antennæ are composed of but two joints, with a feathered bristle attached to the second joint. Upon the lower part of the head is the proboscis which, as shown at *c* in Fig. 2, projects slightly forward. At the sides of the proboscis are two long palpi which are thickly covered with hair. At the upper portion of the head are the three simple eyes, placed in the form of a triangle. The thorax, or that portion just back of the head, is quite large and is crossed in front of the middle by a transverse impressed line, while near the posterior portion of the thorax is a triangular portion known as the scutellum. The abdomen is hairy, small, nearly as broad as long, and slightly flattened above.

An enlarged egg is shown at *a* in Fig. 1. It is small, elongate, somewhat curved, and white, becoming darker before hatching.

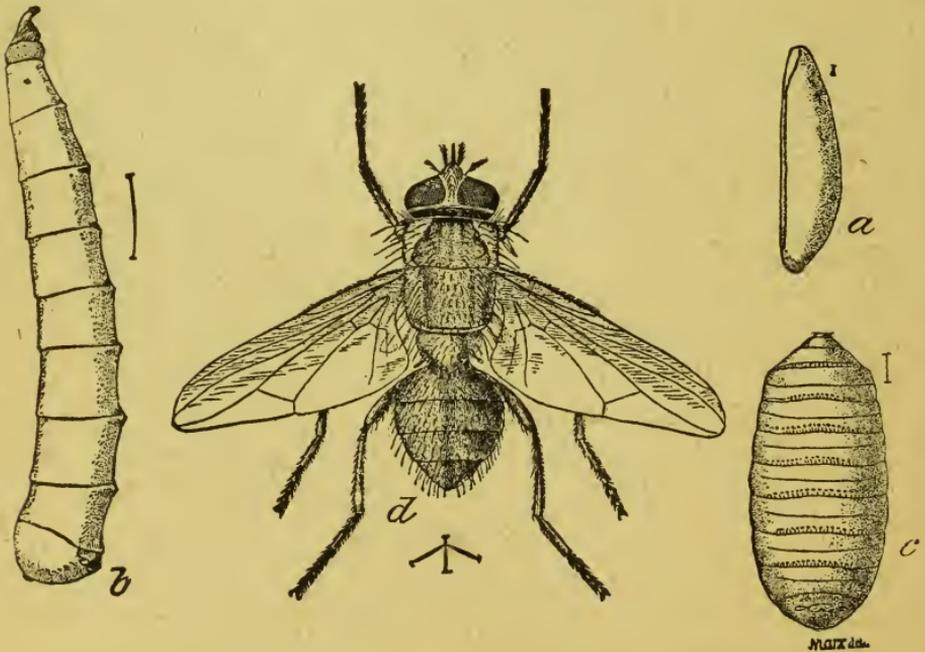


Fig. 1.—The Horn-fly: *a*, egg; *b*, larva; *c*, puparium; *d*, adult in biting position. All enlarged. (From Insect Life.)

The larva is shown at *b* in Fig. 1, and when full grown measures three-eighths of an inch in length. The posterior portion of the body is broadest, tapering slightly toward the head.

The puparium is of a dark brown color, about one-fifth inch in length, and is shown at *c* in Fig. 1.

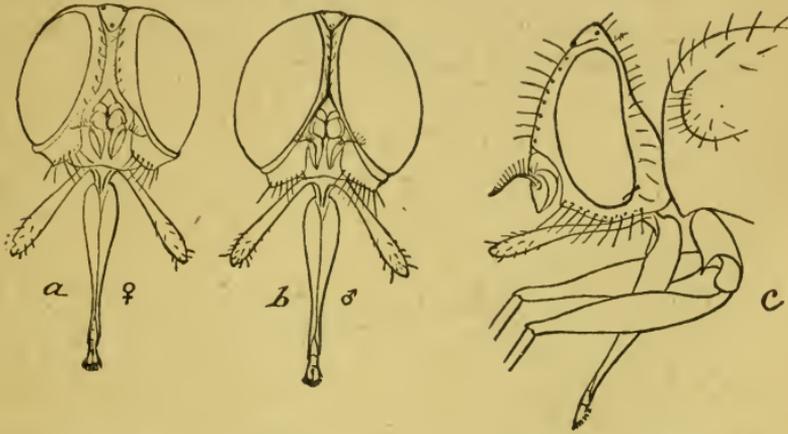


Fig. 2.—The Horn-fly: *a*, head of female, front view; *b*, head of male, front view; *c*, head from side. All enlarged. (From Insect Life.)

#### LIFE HISTORY AND HABITS.

The eggs of the Horn-fly are laid in fresh cow dung and hatch into larvæ within twenty-four hours. In about eight or ten days the larvæ, having become full grown, form pupæ at or just below the surface of the ground under the manure, and in a few days the flies emerge. The length of time required for the transformation from the egg to the fly will vary somewhat with the weather. During the warmer months it requires but about ten days for the transformation, but on an average it requires about two weeks.

When very numerous the flies are to be seen about the horns, giving them the appearance as shown in Fig. 3, and it is because of their habit of thus alighting upon the horns that has given the species the popular name of "Horn-fly." No damage is done to the horns however, the flies simply resting there for protection from the animal's efforts to avoid them. The flies may also be seen upon the flank and along the back with their

heads generally pointing toward the head of the cow. Another favorite resting place for the flies is upon the forequarters. The eggs are laid singly in fresh cow dung, immediately after it is passed, and after oviposition the flies resume their position upon the cow. In their efforts to avoid the flies, the cattle switch the tail from side to side and jerk the head from one side to the other, causing the flies to leave their position, but they resume it again almost immediately.

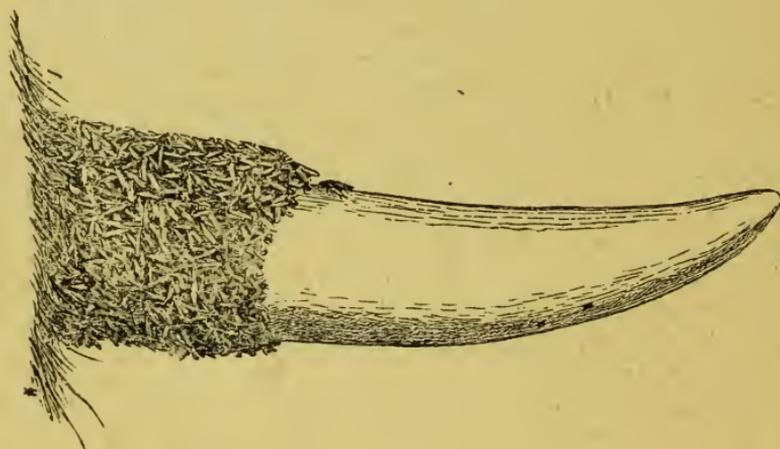


Fig. 3.—Horn showing band of resting flies. Reduced. (From *Insect Life*.)

The flies suck blood from the cattle, producing irritation and worry to such an extent as to cause a decrease in milk from one-third to one-half. It has been our observation that dark colored cattle are more subject to attack from the Horn-fly than are cattle of a lighter color, one often seeing a white and a black cow standing side by side where the former will be nearly exempt from attack by the flies, while the latter will be covered with them. Some writers claim that the thin skinned animals are most attacked, but this has not been our observation, color having more to do with the attack than has anything else, although why this is the case we do not attempt to explain.

Each female fly lays a large number of eggs, and as it requires such a short time for the transformation from the eggs to the flies, there are many broods during the warmer months. They

pass the winter mostly as pupæ, although some flies are to be seen on warm days.

### PARASITES.

In the annual report of the Entomologist of the Department of Agriculture for 1890, Dr. Riley mentions eight species of parasitic insects bred from cow dung and it is probable that these insects destroy large numbers of the larvæ of the Horn-fly.

### REMEDIES.

The remedies for the Horn-fly consist of (1) various applications to the animals to keep the flies off; (2) applications to the animals to kill the flies; and (3) applications to the dung to kill the larvæ.

During the past two seasons we have experimented with many substances which have been applied to keep the flies from the animals, most of which have proved of but little value, as they evaporate so readily. The following, however, have been fairly satisfactory, as they keep the cattle free from the flies from a week to ten days:

Crude cotton seed oil or fish oil and pine tar mixed, about two parts of the former to one of the latter. The two mix readily and are very easily applied to the animals at milking time by means of a large paint brush. Applied in this manner it takes but a half minute to a cow, making the cost of the application but a small item. We have treated 350 head at a time with the crude cotton seed oil and tar in this way, using but four gallons of the oil and less than two gallons of the pine tar. The cost of the oil is thirty cents per gallon and of the tar about fifty cents, making the total cost of the application to 350 head about \$2.20, or about three-fourths of a cent per head.

A preparation known as "Gnat Oil," which is largely used in some localities for Buffalo Gnats, as its name implies, has given about the same success as the above. It is made as follows:

Crude Carbolic Acid, 1 ounce,

Pennyroyal,  $\frac{1}{2}$  to 1 ounce,

Sulphur,  $\frac{1}{4}$  pound.

Crude Cotton Seed Oil, 1 gallon.

This was applied to the animals in the same manner as was

the first preparation, and we were unable to see any difference in the animals treated with the gnat oil and those treated with the crude cotton seed oil and pine tar mixture, both preparations keeping the animals free from the flies from a week to ten days, depending to some extent upon how numerous the flies were at the time.

The best application to kill the flies is kerosene emulsion. In 1892 we experimented quite successfully in this line. The milk emulsion was used, made by mixing thoroughly one part of slightly sour milk with two parts of kerosene and then diluting this with twelve to fifteen parts of water. The emulsion was applied to the animals at milking time by means of a knapsack sprayer, directing the spray directly upon the flies as much as possible. After three applications in as many days the flies were killed out so that they were not again numerous until nearly three weeks later. In 1893 the emulsion remedy was again tried but not with as favorable results. The crude cotton seed oil and tar mixture being so cheap and so easily applied, we have adopted this method of treatment as the best.

Some writers have recommended the application of lime or plaster to the cow dung in the field to kill the larvæ as being the best method of lessening the numbers of the Horn-flies. The conditions as to the pasturage of the animals throughout the South, however, is such that this method of treatment is not practicable.

#### TREATMENT RECOMMENDED.

Application to the animals of substances to keep the flies off is the best treatment for the Horn-fly. Of the many substances used for this purpose, two parts of crude cotton seed oil mixed with one part of pine tar, we consider the best, cheapest, and the most easily applied. It should be applied to the animals at milking time with a large paint brush, the cost being but three-fourths of a cent per cow. If the crude cotton seed oil cannot be readily obtained, fish oil or any other cheap oil may be used in its stead.