

XVII. *Further observations on the Relation between the Colour and the Edibility of Lepidoptera and their Larvæ.* By J. JENNER WEIR, F.L.S.

[Read 4th July, 1870.]

I BEG to exhibit some perfect specimens of *Cucullia verbasci*, and with reference to my former communication (see Trans. Ent. Soc. 1869, p. 21), I have to lay before the Society a few further observations on the Relation between the Colour and the Edibility of *Lepidoptera* and their Larvæ, in which the history of these specimens of *Cucullia verbasci* will be narrated.

Mr. H. D'Orville, in a communication to the Entomologist's Monthly Magazine, vol. vi. p. 16, states that he has had some hundreds of the larvæ of *Cucullia verbasci* in his garden, but as soon as they began to show colour and size, and appear on the upper-side of the leaves and on the stems to partake of the flowers, "down come the birds, and off go the larvæ." He adds, that he therefore cannot feel so satisfied as I express myself to be, that, as a general rule, birds refuse to eat gaily coloured larvæ.

Mr. D'Orville also suggests, that the birds on which I made my experiments reject in confinement food which they would partake of if at liberty. My own experience is quite opposed to this suggestion, and I am inclined to think that the contrary is the fact, and that birds in captivity, being deprived almost entirely of insect food, eat readily species that in a state of liberty they would disregard.

After reading Mr. D'Orville's communication, I became very desirous of obtaining a brood of *Cucullia verbasci* for experiment, and I was fortunate enough to find them in some plenty at Lewes on the *Verbascum thapsus*.

I brought away a sufficient number for my purpose, leaving, however, some behind; these, I am informed, grew and thrived so well, that the plant was utterly disfigured by their ravages, and was removed as unsightly from the garden. It may therefore, I think, be assumed, that the birds of Sussex did not eat the larvæ of *Cucullia verbasci*.

Upon reaching Blackheath, my specimens were placed on the *Verbascum blattaria*, in my own garden, and were carefully watched and counted daily, until they became nearly full-grown; at this period of their existence, they had almost destroyed every leaf of the food-plants, and had begun to gnaw holes in the bare stems; still not one was missing. To make the experiment as conclusive as possible, I attracted birds to the plants, by strewing around them different kinds of food; this was eaten, but the larvæ remained day after day consuming the flowering stems of the *Verbascum*.

I also gathered some stems of the plant, and placed them in water in my aviary (which contained most of the birds mentioned in my former paper), feeding on them for several days four large specimens of the larvæ; these ate up every leaf, and completely defoliated the flowering stems, yet they remained quite unmolested.

When the time arrived for the larvæ to assume the pupal state, I occasionally missed a specimen, but by digging around the stem of the plant, I found the straggler, and placed it in a breeding cage. This spring, they assumed the imago state, and the specimens I exhibit have passed with impunity through the dangers detailed above.

Cucullia verbasci in the perfect state looks like a piece of dried wood, and if my theory is correct, the imago ought to be eaten by birds, because its coloration is protective; and upon placing it in the aviary, it was at once seized and greedily devoured.

The following observations are taken from my journal, in which the notes were entered at the time the experiments were made with the birds in my aviary.

The larvæ of *Odonestis potatoria* and *Lasiocampa quercus* were not eaten, but were quite disregarded even when moving. These are both hairy larvæ.

The larvæ of *Eriogaster lanestris*, even in the young state, before the hairs had assumed the brown colour and the specimens appeared almost smooth, were refused entirely.

The gaily coloured larva of *Diloba cæruleocephala* was examined when moving, but not eaten.

The black, white, and yellow larva of *Abraxas grossulariata* was not even noticed.

The brilliantly coloured and somewhat hairy larva of *Porthesia auriflua*, even when crawling, was not regarded.

No notice was taken of the chocolate and yellow larva of *Hibernia defoliaria*.

A thrush belonging to my brother, which I constantly fed with insects, rejected the gaily coloured slightly hairy larva of *Clisiocampa neustria*.

The birds very hungry, but *Clisiocampa neustria*, *Diloba cæruleocephala*, and *Abraxas grossulariata* all crawling about the aviary untouched.

The bright crimson and brown imago of *Euchelia jacobææ* was allowed to move about the aviary for some time, but at last, after the removal of the wings, was swallowed, evidently with reluctance; this is a species which flies in the day time, with a very weak flight, and appears to make no attempt at concealment; it would, probably, be unmolested by wild birds.

I may add, that my belief in the protective use to insects of bright colours remains unshaken, but that I agree with Mr. D'Orville, that "some birds will eat certain larvæ which may be distasteful to others."

It is quite possible, that one of the reasons why a species of insect is often so rare in places where its food plant is abundant, may be the presence of the bird that feeds upon it, while its abundance in other districts may be due to the absence of its special enemy, rather than to the abundance of its food.



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