

FUGITIVE COLOR IN THE MALES OF CERTAIN PIERIDAE

HARRY K. CLENCH

Carnegie Museum of Natural History, Pittsburgh, Pennsylvania 15213

In late June 1973 I collected a series of *Nathalis iole* Boisduval at Nicolls Town, North Andros Island, in the Bahamas. They were spread shortly after my return home and a curious fact was then immediately evident. The small, oval, androconial patch of each of the males, near the base of the costa on the upperside of the hindwing, was bright, vivid orange. In all our other males of *N. iole* this patch is dull yellow, regardless of whether they came from the West Indies (including New Providence Island in the Bahamas), the United States or Central America.

A month or so later Mr. Allan Watson of the British Museum was visiting us and I told him about this odd population. I showed him the series, the first time in several weeks that I had seen the specimens myself. The orange color of the androconial patches seemed to be much duller and less striking at this time than I had remembered it earlier. In late August, two months from when they had been captured, I examined the series once again. The orange color was completely gone, and the specimens were all perfectly ordinary-looking *N. iole*, with the androconial patches the usual dull yellow.

I then wrote to two colleagues, Dr. Lee D. Miller and Mr. F. Martin Brown, both of whom live in "iole country," and described the situation, asking them if they could catch and examine fresh *N. iole* males to see what color the patches were in their areas. They both reported them to be orange, as they had been in the Andros specimens.

In early June 1974 I took additional *N. iole* in the Bahamas, this time on Grand Bahama Island, at Pine Ridge, 4 mi. NE of Freeport. In July, just over a month since they were captured, the scent patches of the males were orange (although not as bright as I recall them in the Andros series); in August, two months after capture, the orange was gone (a slight trace in one specimen may have remained). Examination of specimens under a dissecting microscope in July showed nothing unusual other than a uniform orange tinge to the patch.

This color change in the androconial patch of male *N. iole* had been observed long ago by Gundlach (1881:100).

On North Andros in June 1973 I also caught a pair, male and female, of *Eurema (Pyrisitia) messalina blakei* Maynard. After they had been spread an examination showed that the male (but not the female) had a distinct pink bar on the underside of the forewing, running from near

the base distad for about 2/3 of the inner margin, in interspace Cu₂-2A. Other *E. messalina* males in the collection, from the Bahamas, Cuba and Jamaica, had no pink on any of them.

I kept this curiosity in mind when in the Bahamas again in June 1974. On South Andros Island, near Driggs Hill, *E. messalina* was not uncommon and I obtained a series, examining each of them as it was caught. The males all had the pink bar.

On my return to Pittsburgh I examined again the now year-old male from North Andros. To my surprise the pink bar had disappeared completely. I had examined this male in April 1974 and am reasonably sure that the pink bar was still present, some 10 months after capture. Examination of my June 1974 specimens in August, two months after capture, showed that of eight males, the patch was absent in two, extremely faint in five, clearly visible in one.

When the newer specimens had been spread I examined the males under the dissecting microscope. The scales in the pink area were white and all seemed identical in structure to the scales in the white areas nearby on the wing, except that each one had its distal edge narrowly and sharply bright red, as though it had been dipped in red ink.

The situations in the two species are probably related. In both species only males are involved; and in both species the color is fugitive. It may also be significant that the ground color of *Eurema messalina* is white and the fugitive color of the bar is pink, whereas in *Nathalis iole* the ground color of the patch is yellow, which would appear orange if combined with pink. In other words, the transient pigment may be red in both, but appear as pink in *E. messalina* on the white ground, and as orange in *N. iole* because the patch substrate is yellow.

The transient color in *N. iole* is clearly associated with an androconial patch, a readily seen and morphologically distinct structure. The underside of the forewing near the inner margin, where the pink bar occurs in *E. messalina*, is also a common site of androconial structures. It seems at least possible that the pink color transiently indicates an androconial area in that species that otherwise is not characterized by any visible structural modification.

If this is indeed the case, then androconial patches or areas may be present in more species than we know. Ordinary visible scent patches are useful taxonomic structures, their presence, location and configuration providing valuable clues to relationships. If less easily visible patches also exist, their attributes could be just as useful once they are made known. Some of them may be transiently visible because of an evanescent pigment, as is presumably true of *E. messalina*. In some species

such pigments might be even more fugitive than in either of those reported here, so examination of males should be made when they are captured or as soon as possible thereafter.

It is even conceivable that androconial patches may exist without any ordinarily visible clue whatever, should the transient substance(s) associated with them be unpigmented. Perhaps such patches could be "developed," by prompt treatment with a suitable reagent that would render the substance visible; or perhaps submicroscopic structural differences exist in the scales, invisible under conventional magnification but showing up, say, in the scanning electron microscope.

Transient pigment need not always be associated with androconial areas. Clark & Clark (1951: 87) describe fugitive pink color in the North American pierid, *Euchloe olympia* Edwards, that may well be non-androconial. They make no mention of the sex of the individuals that show it, but the manner of their description suggests that it may be in both sexes; and the pink is found on wing areas where androconial patches rarely occur (anterior part of the hindwing underside; costal area of the forewing on both surfaces). From the Clarks' description we cannot yet rule out completely the possibility that the evanescent pink of *E. olympia* is androconially associated, but it seems unlikely.

LITERATURE CITED

- CLARK, A. H. & L. F. CLARK. 1951. The butterflies of Virginia. Smithsonian Misc. Coll. 116 (7), vii + 239 p., ill.
- GUNDLACH, J. 1881. Contribucion a la entomologia Cubana. Habana (G. Montiel). 445 + xii p.