NOTES ON MELANISM IN SOME CONNECTICUT MOTHS

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Abstract Proportions of melanic and melanistic individuals are recorded in 9 species of Noctuidae and Geometridae. Local edaphic, perhaps plant-successional, factors are believed responsible, rather than industrial darkening. The samples recorded were unbiased by collector selection.

In recent years melanism in moths has been extensively studied in Europe, particularly in England, with important ecologic and genetic results that are of value in their application to our knowledge of the evolutionary mechanism. A summary of the work and a replete bibliography will be found in Kettlewell (1961). In the meanwhile, practically nothing has been done in North America in this respect, although it is obvious that a perhaps even more fertile opportunity for such work exists here. In an excellent paper Owen (1962) presented the results of a survey of the specimens of 6 species of North American geometrid moths in many collections, showing that both "industrial" and "non-industrial" environmental factors probably exert various regional influences. As this author pointed out, the study of specimens in collections is valuable chiefly as an indicator of possibilities for future experimental work, owing to the almost universal habit of collectors and curators of saving most or all of the rarer (melanic) specimens, but of discarding many or most of the commoner (non-melanic) ones. Any existing collection is, therefore, bound to be strongly unrepresentative and unreliable for calculations of population proportions, to say nothing of population changes.

For this reason, during July and August of 1961, when collecting at light in Putnam, Conn., I preserved every specimen of a number of species of moths that past years of collecting at the same place had shown to have numerous melanics. Collecting during previous seasons had not been complete and is, therefore, of only general interest. I intend to pursue the policy in future collecting of saving all specimens of at least some species. Eventually these figures will, it is hoped, give a relatively unbiased picture of the melanism in the species treated, and may in time serve as a useful background to more widespread and experimental work by others. All specimens are in the American Museum of Natural History.

The lights used were 2 banks of 3 each, of 15 watt General Electric fluorescent tubes. In each bank the central tube was of the "daylight" type and the two outer tubes were of the "black light" type that has a very high peak of output at about 3500 Angstroms. The use of the central "white light" tube serves a double purpose: it not only allows better visibility and recognition of specimens, but appears to the author to stim-

ulate the moths to come to rest more quickly after flying about the lights for a while. The lights were on a large, white sheet against the wall of the house, and about 3 feet above a close-cut lawn. Within 50–150 ft. are a dense stand of White Pine about 22 years old, an open growth of mixed oaks and other hardwoods, and a highly disturbed meadow containing many grasses, shrubs and herbs.

NOCTUIDAE, PANTHEINAE

Panthea furcilla Packard. In the series nearly every possible gradation occurs, in a symmetrical distribution curve, between normal, light grey individuals and fully melanic ones, so that the division into "normal", "melanistic" and "melanic" is somewhat subjective.

♂ ♂ : melanic 19; melanistic 47; normal 20; total 86
♀ ♀ : strongly melanistic 2; normal 2; total 4

Colocasia propinquilinea Grote

♂ ♂ : melanic 1; normal 11; total 12

Charadra deridens Guenée

♂ ♂ : melanic 4; melanistic 4; normal 13; total 21

Raphia frater Grote. A hundred or more specimens were seen but few taken, since no melanics of this species have ever been seen at Putnam.

GEOMETRIDAE. None of the species listed except *Lycia cognataria* Guenée were treated by Owen. The identifications were made by F. H. Rindge.

Lycia cognataria Guenée (*Biston* (*Lycia*) *cognataria* Guenée in Owen)

♂ ♂ : melanic 1; very slightly melanistic 4; normal 37; total 41

The species is very closely related (perhaps actually conspecific) to the European *Biston betularia* L. which shows such striking industrial and other melanisms. I have seen series of it taken some years ago in Tyringham, Mass. by Prof. Asher Treat that showed a large percentage of melanism; but Prof. Treat informs me that recently the melanics appear to be getting scarcer there.

Hypagyrtis subatomaria Wood. The life history of this species and its relationship to *H. piniata* Packard are not at all clear. I suspect that at Putnam it has a green-and-white striped larva on White Pine (*Pinus strobus*) but have not gotten these larvae through the hibernating pupal stage.

♂ ♂ : melanic 10; melanistic 16; normal 9; total 35
♀ ♀ : melanic 3; melanistic 6; normal 1; total 10

Ectropis crepuscularia Huebner

♂ ♂ : melanic 2; normal 3; total 5
♀ ♀ : normal 1

Melanolophia canadaria Guenée

♂ ♂ : melanic 2; normal 6; total 8

DISCUSSION

Whatever the factor or factors that influence the incidence of melanism at Putnam it is, of course, impossible to say. Darkening of the environment by industrial pollution probably has little effect, for the region is still essentially rural, and both corticolous and saxicolous lichens are abundant. There may be a strong, edaphic effect from the heavy stand of White Pine,

creating a notably dark and heavily shaded environment, at the edge of which the collecting was done. This certainly accounts for the relative abundance of *Panthea furcilla,* a pine feeder.

It is greatly to be hoped that many other collectors will make consistent "total counts" of all species showing any appreciable melanism, and record the results. Only in this way can a body of knowledge be built up that will serve as a basis of comparison for other workers in our rapidly changing environment.

Literature Cited

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SCENT-APPARATUS MORPHOLOGY OF *LEPTOCORISA COSTALIS* H. S. (HETEROPTERA: COREIDAE), WITH COMMENTS ON GLANDULAR SECRETIONS IN HETEROPTERA

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Abstract The anatomy and the mode of action of the scent-apparatus of *Leptocorisa costalis* H. S. is described and discussed. Recent studies on the chemistry of the glandular secretion have thrown some light on the feeding habits, sexual activity and probably on the phyogenetic relationship of various families in Heteroptera.

Leptocorisa costalis H. S. is found in rice fields and wild grass in India. Although Akbar (1957–58) studied the morphology and the life-history of *Leptocorisa varicornis* F. in detail, he omitted consideration of its scent-apparatus. As far as is known, no account of the scent-apparatus of *Leptocorisa* is available. The present study is aimed at filling that gap.

The adults were collected in August/September, 1954 on wild grass in the Ayurvedic Gardens on the campus of Banaras Hindu University, India. Dissections were made on fresh specimens and materials preserved in 70 per cent alcohol. All drawings were made with the aid of an ocular grid and are not to the same scale.

Scent-apparatus (Fig. 1) On opening the body cavity and removing the overlying viscera, the scent-apparatus is visible below the digestive tract, lying in the region of the metathorax. It consists of a pair of compact glands, a median reservoir, a vestibule and an ostiole or external orifice.

The glands The glands are compact masses of convoluted tubes which