

Melanic moth frequencies in Yorkshire, an old English industrial hot spot

Abstract

A survey has been carried out in Leeds, England, in the west Yorkshire industrial heartland, and in neighboring York, surrounded by agriculture, of melanic frequency in the moth species *Biston betularia*, *Odontoptera bidentata*, and *Apamea crenata*. All show a decline in melanics in the postindustrial environment, the first over almost the full range from nearly 100% to less than 10%, the others to smaller extents. Changes in several species over as great a magnitude and as wide an area must result from selection. The results are compared with others along a transect through northern England. The onset of response is progressively later from west to east. The rate of decline is lower at the extremes of the transect to west and east than it is in the center. We still do not have a clear picture of the causes of the changes. One major factor is likely to be selective predation, which is shown to be critically dependent on predation rate. As a consequence, differences in settling behavior between the species could account for different responses even if the species are attacked by the same predators.