

Color Polymorphisms in Feral Pigeon Populations

Through domestication, many different color morphs of the domestic pigeon, *Columba livia domestica*, have arisen. These morphs range in color from white to brown to black, and include the standard coloration of the wild rock dove, *C. livia*. Over time, domestic pigeons have been released or have escaped back into the wild, and have thus formed stable feral populations around the world. These feral populations interbreed with wild rock dove populations, but have somehow still maintained their polymorphic colorations. Considering that significantly fewer domestic pigeons are kept than have been historically, it seems unlikely that this maintenance of the polymorphism is due solely to migration from the domestic populations. Further, Jacquin et al. (2013) found a trend in eumelanistic coloration between urban and rural areas, where darker colored morphs were more prominent in more urbanized areas, while lighter morphs were more prominent in rural areas. Because of the gene flow between feral and wild pigeon populations, as well as between feral populations in areas of differing levels of urbanization, it is possible that these population differences are due to local adaptation rather than random genetic drift. Because of melanin's role in the immune system, Jacquin et al. (2011 and 2013) predicted that coloration would have an impact on parasite infections and parasitic load. They found that darker colored morphs showed no difference in parasitic infections between rural and urban areas, but that lighter morphs showed greater rates of infection in urban areas, and lower rates than dark morphs in rural areas. This could explain the differential distribution of light colored morphs in rural vs. urban areas. They also found that, regardless of the parasitic prevalence in the population, dark morphs had lighter parasitic loads than light morphs, suggesting an improved ability to cope with parasites, which could further help them survive in urban areas. Jacquin et al. (2012) also found physiological relationships between body weight gain and food availability, which suggest that dark morphs should perform better in urban areas where humans cause food to be readily available, compared to the restricted food in rural areas. These lines of evidence suggest that there may be a benefit to having a darker coloration in urban areas, and a lighter coloration in rural areas, which would contribute the maintenance of color polymorphisms in feral pigeon populations.

References

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