

- . 1975. Molecular population genetics and evolution. Amsterdam, North-Holland Publ. Co.
- . 1978. Estimation of average heterozygosity and genetic distance from a small number of individuals. *Genetics* 89: 583-590.
- PATTON, J. C., & J. C. AVISE. 1986. Evolutionary genetics of birds. IV. Rates of protein divergence in waterfowl (*Anatidae*). *Genetica* 68: 129-143.
- PATTON, J. L. 1985. Population structure and the genetics of speciation in pocket gophers, genus *Thomomys*. *Acta Zool. Fennica* 170: 109-114.
- PAULKE, E., & E. HAASE. 1978. A comparison of seasonal changes in the concentrations of androgens in peripheral blood of wild and domestic ducks. *Gen. Comp. Endocrinol.* 34: 381-390.
- ROBBINS, M. B., M. J. BRAUN, & E. A. TOBEY. 1986. Morphological and vocal variation across a conspecific. *Gen. Comp. Endocrinol.* 34: 381-390.
- SARICH, V. M. 1977. Rates, sample sizes, and the neutrality hypothesis for electrophoresis in evolutionary studies. *Nature* 265: 24-28.
- SOUTIERE, E. C. 1986. Hand-reared Mallard releases on three private farms in Maryland. *Proc. Annu. Conf. Southeast. Assoc. Fish Wildl. Agencies* 40: In press.
- . In press. Survival rates of hand-reared Mallards released on two private farms in Maryland. *J. Wildl. Manage.*
- WHITE, M. J. B. 1978. Modes of speciation. San Francisco, Freeman.
- WILLIAMS, D. M. 1983. Mate choice in Mallards. Pp. 297-309 in *Mate choice* (P. P. G. Bateson, Ed.). Cambridge, Cambridge Univ. Press.
- tact zone between the chickadees *Parus atricapillus* and *P. carolinensis*. *Auk* 103: 655-666.

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### Response to Hepp et al.

C. DAVISON ANKNEY<sup>1</sup> AND DARREL G. DENNIS<sup>2</sup>

Perhaps several thousand more years of geographical isolation would have resulted in the "Black Mallard" becoming a good biological species. However, the arguments presented by Hepp et al. will not make that happen. We respond to their arguments as follows:

1. *Genetic distance.*—We have no quarrel with their literature review. It is simply an expanded version of our statements (Ankney et al. 1986: 706, 708): "We agree with the arguments of Barrowclough (1980), Gutiérrez et al. (1983), and Johnson and Zink (1983) that the genetic distance between two taxa does not, per se, indicate their taxonomic status," and "Thus, our data showing a very low level of genetic distance between Mallards and Black Ducks are consistent with the species' incomplete reproductive isolation."

2. *Game-farm Mallards.*—Their argument is irrelevant for two reasons. First, game-farm Mallards are, of course, still Mallards. More important, hybridization of Mallards and Black Ducks occurred long before captive release programs: "There are however, other interesting variations in *A. tristis* [= *rubripes*], such as the irregular occurrence of characters that are essentially Mallard. I mean here variations that occur outside of the rather common hybrids with the Mallard" (Phillips 1912).

Hepp et al. apparently think that the mating system

of the million or more Mallards that now breed in Ontario and Quebec is like that of Aylesbury ducks (i.e. white barn-yard ducks), because their argument about promiscuity was based on a study of such ducks. To us, Ontario/Quebec Mallards look and behave like wild Mallards, e.g. those breeding on the prairies. We cannot, however, comment on the behavior or appearance of Mallards in the southeastern U.S.

3. *Isolating mechanisms.*—Hepp et al. state that the two taxa have "species-specific courtship displays." They must be unaware of Johnsgard's (1960) classic paper which showed otherwise.

Fortunately, or perhaps not for the "Black Mallard," the answer to this debate, unlike many in evolutionary ecology, lies in the present and future, not in the past. The two taxa provide an excellent example of what happens when geographical barriers to mating break down before pre-mating isolating mechanisms have evolved.

We predicted (Ankney et al. 1986, 1987) that the outcome of this will be genetic swamping of the "Black Mallard" through introgressive hybridization. It is irrelevant to this prediction whether or not the two taxa retain their specific status. Furthermore, nothing in the comments by Hepp et al. moves us to change this prediction. We stand by everything that we said in Ankney et al. (1986).

### LITERATURE CITED

<sup>1</sup> Department of Zoology, University of Western Ontario, London, Ontario N6A 5B7, Canada.

<sup>2</sup> Canadian Wildlife Service, 152 Newbold Court, London, Ontario N6E 1Z7, Canada.

- ANKNEY, C. D., D. G. DENNIS, L. N. WISHARD, & J. L. SEEB. 1986. Low genic variation between Black Ducks and Mallards. *Auk* 103: 701-709.

- , ———, & R. C. BAILEY. 1987. Increasing Mallards, decreasing American Black Ducks: coincidence or cause and effect? *J. Wildl. Manage.* 51: 523-529.
- HEPP, G. R., J. M. NOVACK, K. T. SCRIBNER, & P. W. STANGEL. 1988. Genetic distance and hybridization of Black Ducks and Mallards: a morph of a different color? *Auk* 105: 804-807.
- JOHNSGARD, P. A. 1960. A quantitative study of sexual behavior of Mallards and Black Ducks. *Wilson Bull.* 72: 133-155.
- PHILLIPS, J. C. 1912. A reconsideration of the American Black Ducks with species reference to certain variations. *Auk* 29: 295-306.

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### Are Weekend Data Suspect?

ROBERT P. YUNICK<sup>1</sup>

D. J. Mountjoy and R. J. Robertson (1988, *Auk* 105: 61) found 65-77% of the immature Cedar Waxwings they examined lacked waxy tips. They cite that I found 95% of the birds I banded and 91% of the specimens I examined lacked tips. They attribute the difference in results to: "Some juveniles with only a few small tips may have been overlooked in Yunick's study as the data were collected during the operation of a

weekend-manned banding station" (1988, *Auk* 105: 65).

As a bander who has banded on all days of the week (birds and time being available), I fail to understand what significance weekends have in causing data collected on those days to be any different from data collected on any other day. Further, while my banding data were collected on weekends, my specimen data were not. Therefore I suggest that the reason for the differences in our data is attributable to some factor or factors other than weekends.

<sup>1</sup> 1527 Myron Street, Schenectady, New York 12309 USA.

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### Response to R. P. Yunick

D. JAMES MOUNTJOY<sup>1</sup> AND RALEIGH J. ROBERTSON<sup>2</sup>

Unfortunately, Yunick (1988) appears to have misinterpreted the meaning of a statement in our paper (Mountjoy and Robertson 1988). We did not intend to suggest that the day of the week on which the data were collected should have any influence on the results. However, it does seem realistic to suggest that the manner in which data are collected may affect their reliability.

Yunick (1970: 291) states that the banding data were gathered between 1966 and 1969 "as part of the operation of a weekend-manned 'Operation Recovery' station." He also acknowledges the assistance of 5 people in collecting the data. It is a fact that the various banders collected data intermittently over a long period of time and collection was incidental to the

primary function of the station. Considering the small size of the feather tips on immature Cedar Waxwings (some individuals have only a single tip less than 1 mm in length), it seems possible that some feather tips might have been overlooked. Of course, these arguments do not apply to the smaller data set which Yunick collected personally from museum specimens. If Yunick can establish what other factors might account for the differences in our data, we would be pleased to hear about it.

#### LITERATURE CITED

- MOUNTJOY, D. J., & R. J. ROBERTSON. 1988. Why are waxwings "waxy"? Delayed plumage maturation in the Cedar Waxwing. *Auk* 105: 61-69.
- YUNICK, R. P. 1970. An examination of certain aging and sexing criteria for the Cedar Waxwing (*Bombycilla cedrorum*). *Bird-banding* 41: 291-299.
- . 1988. Are weekend data suspect? *Auk* 105: 808.

<sup>1</sup> Department of Biology, McGill University, 1205 Docteur Penfield Avenue, Montreal, Quebec H3A 1B1, Canada.

<sup>2</sup> Department of Biology, Queen's University, Kingston, Ontario K7L 3N6, Canada.

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