

Proceedings of the Iowa Academy of Science

Volume 64 | Annual Issue

Article 84

1957

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Recommended Citation

Becker, Elery R.; Hollander, Willard F.; and Farmer, John N. (1957) "Occurrence (1956) of *Haemoproteus sacharovi* and *Plasmodium relictum* in a Central Iowa Pigeon Colony," *Proceedings of the Iowa Academy of Science*: Vol. 64: No. 1 , Article 84.
Available at: <https://scholarworks.uni.edu/pias/vol64/iss1/84>

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Occurrence (1956) of *Haemoproteus sacharovi* and *Plasmodium relictum* in a Central Iowa Pigeon Colony¹

By ELERY R. BECKER, WILLARD F. HOLLANDER
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Naturally occurring infections of *Plasmodium relictum* and *Haemoproteus sacharovi* in pigeons of Central Iowa have recently been reported (Becker, Hollander and Pattillo, 1956). In that survey, involving pigeons of all ages, both microscopic examination of stained blood films and isodiagnosis were employed, but the examination of blood films stained in Giemsa was the sole procedure relied upon in the 1956 survey. The birds concerned were young, ranging in age from two to eight weeks. All belonged to the Central Iowa colony to which reference was made in the previous paper.

A total of 114 blood films was examined, distributed by dates as follows: June 29, 32; July 21, 23; September 8, 33; September 18, 26. There were a few duplications among the birds examined on September 8 and September 18. The average ages (in weeks) of the squabs on the four dates were as follows: June 29, 4.7; July 21, 3.7; September 8, 3.6; September 18, 4.4. There were, in addition, two other young squabs which will be discussed later.

No parasites were detected in the smears made on June 29. Squabs Nos. 3 and 6, aged 4 weeks and 3½ weeks, respectively, were positive for *Haemoproteus sacharovi* on July 21. The second bird had been the victim of a certain amount of feather picking, but the first had not. Squab No. 20 (aged 4 weeks and a female) of the September 8 group was found to be positive for *Plasmodium relictum*, with 7 percent of its erythrocytes parasitized. The only infection detected in the September 18 group was in the bird that was positive on September 8, but by this time only one parasite was seen for approximately 5,000 erythrocytes observed. This bird made a complete recovery.

The squabs positive for *Haemoproteus sacharovi* on July 21 were brought to the laboratory and kept under observation. The forms seen inside the erythrocytes of No. 3 on July 21 were very small, unpigmented rings. Their development to the huge male and female gametocytes characteristic of the species was followed, and will be the subject of a later report. The parasites in No. 6 consisted of more nearly mature forms.

Squab (No. 123) was injected with about ¼ cc. of infected blood drawn from the squab found to be infected with *P. relictum* on

¹Supported (in part) by Grant E-992(C) from the Division of Research Grants, National Institute of Health, Public Health Service.

September 8. The parasites observed and the course of the ensuing infection were in agreement with observations made on infections from injections of naturally infected blood the previous year.

On July 22 blood was drawn from squab No. 3, the one with the young stages of *Haemoproteus sacharovi*. Two young ring-neck doves and two young pigeon squabs, all raised in the laboratory, were each injected intravenously with 0.25 cc. of this blood. Examinations of the blood at intervals of a day or two over an interval of a month failed to reveal that parasitemia had developed in the injected birds. Such an outcome, of course, was to be expected.

Squab No. 3 died about a month after it was brought into the laboratory. Smears of the blood, lungs, liver, kidneys and brain failed to reveal parasites. The spleen of this bird had become colorless and shriveled to the point where it was hardly recognizable, a phenomenon so far not observed by us in any other pigeon. Squab No. 6 is still alive, and without parasitemia.

Two other infections of *P. relictum* were observed in pigeon squabs. D7 was one of two squabs from the same nest, hatched September 2. The operator of the colony (W. F. H.) observed its enlarged and blackish liver, visible through the skin and body wall, on September 13, when it was 11 days old. Its blood smear on that date showed about 17 percent parasitemia. Three days later it died with high parasitemia and anemia, as observed in a post-mortem blood smear. Smears of the organs (brain, liver, spleen, lungs, kidneys, heart) revealed the exoerythrocytic forms typical of *P. relictum*. This infection is of interest for three special reasons: (1) It proved again that patent infection, morbidity and death can be produced in naturally acquired infections of *P. relictum*; (2) since the nest-mate was found to be free of malarial infection, it seemed unlikely that the source of the infection was in the pigeon-milk of the parents; (3) it proved that the exoerythrocytic phase of the parasite can develop in naturally acquired infections.

The other infection was uncovered in a blood smear made on September 26 from a squab killed routinely on that date when it was 37 days old. The tremendously enlarged, blackish spleen, the pigmentation and enlargement of the liver, and the "dirty" appearance of its fat suggested that the bird had had experience with malaria, which was verified by the finding of parasites in the blood smear, but only after prolonged search. This bird had not been found to be positive in the September 18 survey.

Literature Cited

- Becker, E. R., W. F. Hollander and W. H. Pattillo. 1956. Naturally occurring *Plasmodium* and *Haemoproteus* infection in the common pigeon. Jour. Parasit. 42: 474-478.

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