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Survey for Blood Parasites in Redheads (*Aythya americana*) Wintering at the Chandeleur Islands, Louisiana

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ABSTRACT: We detected no infections with species of *Plasmodium*, *Haemoproteus*, *Leucocytozoon*, *Sarcocystis* or *Trypanosoma* in blood smears, liver and spleen impressions, and muscle tissue from 136 redheads (*Aythya americana*) collected or captured at the Chandeleur Islands, Louisiana (USA), during three winters (1987 to 1990). One bird, a juvenile male, was infected with an unidentified species of microfilaria. Thus, we found no evidence that hematozoa had an effect on redheads during the course of the study.

Key words: *Aythya americana*, blood parasites, diving ducks, redhead, winter, Louisiana.

The redhead (*Aythya americana*), a North American diving duck, breeds in the prairie pothole region of northern United States and southern Canada and in the alkaline wetlands of the Great Basin in western United States, and winters in the coastal waters of the Gulf of Mexico in the USA (Florida, Louisiana, and Texas) and Mexico (Bellrose, 1980). In Louisiana the birds concentrate at the Chandeleur Islands (29°50'N, 88°50'W), a barrier island chain 30 km off the state's southeastern coast, where they feed on seagrass rhizomes and marine gastropods (Michot and Nault, 1993; Michot et al., 1994). The number of redheads wintering at the Chandeleur Islands averaged 20,000 birds from 1955 to 1974 (Bellrose, 1980), and has fluctuated since then from a low of 2,000 to 3,000 birds in 1981 to 1983 (Brazda, 1987), to 14,000 to 20,000 birds in the late 1980's and early 1990's (T. C. Michot, unpubl.). This study was part of an effort to determine factors that could contribute to survival of the birds on the wintering grounds. Our objective was to assess the prevalence of hematozoa in this population of wintering birds.

Blood parasite infections occur in red-

heads from postbreeding and wintering areas (Wood and Herman, 1943; Bennett et al., 1982). *Leucocytozoon simondi* infections can cause epizootics among domestic ducks (Fallis and Bennett, 1966; Laird and Bennett, 1970) and in Canada geese (*Branta canadensis*) (Herman et al., 1975). Bennett et al. (1982) speculated that such infections could limit waterfowl production on some parts of the redhead's breeding range.

Redheads were collected by shotgun (under Scientific Collecting Permit Number PRT-718660 from the U.S. Fish and Wildlife Service; $n = 94$) or captured using barrier traps (Haramis et al., 1982; $n = 42$) at the Chandeleur Islands during the winters (November through March) of 1987 to 1988, 1988 to 1989, and 1989 to 1990. Whole blood samples were drawn from the heart into heparinized syringes and placed in 10-ml tubes immediately after death (collected birds) or drawn from the brachial vein into 0.01-ml capillary tubes (captured birds); the blood samples then were placed on ice. One or two thin blood smears were prepared from each whole blood sample within 5 hr of collection, air-dried, and fixed in absolute methanol. Duck carcasses were frozen and retained for later analyses.

In the laboratory, cell impressions from the liver and spleen were taken from thawed carcasses. Skeletal muscle tissue from the thawed carcasses was examined for signs of *Sarcocystis* sp. Slide preparations (impressions and blood smears) were stained with Giemsa and examined with a compound microscope under 400× and oil immersion (1,000×) magnification. A minimum of 100,000 erythrocytes was examined on each slide.

We examined 178 smears and 128 impressions from 136 birds: 72 juveniles (30 female, 42 male) and 64 adults (28 female, 36 male). We found no hematozoa in tissue of the liver and spleen, or in the blood of wintering redheads. One bird, a juvenile male, was infected with an unidentified species of microfilaria. Unfortunately, species identification was not possible because adult worms were not found; the positive blood smear was deposited in the collection of the International Reference Centre for Avian Hematozoa, Memorial University of Newfoundland, St. John's, Canada.

The finding of a microfilarial infection is the first reported for redheads, although such infections are common in other waterfowl species (Wood and Herman, 1943; Stabler et al., 1975). We detected no patent protozoan infections, although a parasitemia could have been present at undetectable levels ($<1/100,000$ erythrocytes) in the blood, or in tissue stages in endothelial cells of the visceral organs.

The prevalence of infection in this study was lower than levels reported from other studies of redhead hematozoa. Nine (16%) of 58 redheads examined were infected with species of *Leucocytozoon*, *Haemoproteus*, or *Plasmodium* in past studies (Wood and Herman, 1943; Burgess, 1957; Kocan and Knisley, 1973; Stabler et al., 1975; Bennett et al., 1982).

Low prevalence of avian hematozoa may have been due to a lack of suitable ornithophilic vectors in certain habitats (Laird, 1961) or microhabitats (Garvin et al., 1993). Yet, *Culicoides* sp. and several species of culicines occur on our study site and are active during the winter (T. C. Michot, unpubl.). Owens (1972) found two ornithophilic culicines on the Chandeleur Islands in summer; those species probably occur there during the winter as well. It also is possible that blood parasite levels were low during the winter months because the ducks are not subjected to high energy demands associated with reproduction and moult (Owen and Reinecke, 1979).

Based on our data, hematozoa had no apparent effect on redheads during the course of the study. Further, there was no evidence that infections of blood parasites affected survival of redheads on their southern wintering grounds at the Chandeleur Islands.

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