

A SEASONAL SURVEY OF HAEMATOLOGICAL VALUES FOR SOME CAPTIVE DIVING DUCKS IN THE TRIBE MERGINI AND THE GENUS AYTHYA

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Long-tailed duck, surf scoter, white-winged scoter, and lesser scaup at US Geological Survey-Patuxent Wildlife Research Center, Maryland

INTRODUCTION

- There are few published reports describing haematological values for diving ducks, primarily due to their inaccessible habitats.
- In many cases the physiological blood values published are following a toxic or disease related event and not representative of normal values.
- Seasonal changes can be confused with disease (Shave and Howard 1976).
- Important to have blood values from healthy ducks as a reference (Kocan 1972).
- An opportunity existed to examine three species of captive seaduck and one captive pochard species, during four seasonal periods in their annual life history.

OBJECTIVES

- Develop haemogram, including parasitemia, using healthy captive diving ducks as a reference for wild ducks of same species.

METHODS

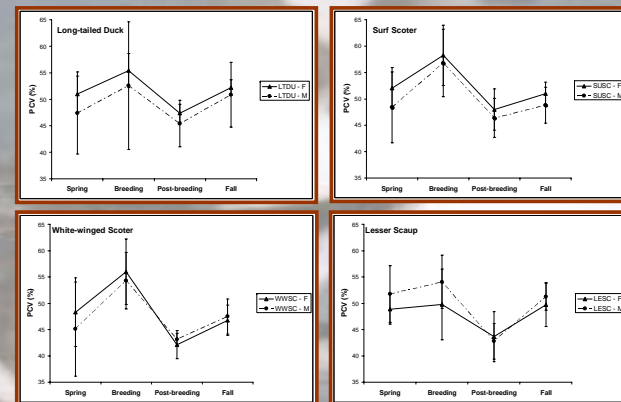
Study population

- 12 long-tailed duck (*Clangula hyemalis*), 9 surf scoter (*Melanitta perspicillata*), 18 white-winged scoter (*Melanitta fusca*), and 36 lesser scaup (*Aythya affinis*); M/F of each species; 9 mo. to 4 yrs. of age.

- Captive diving ducks raised in open-air pens at USGS-Patuxent Wildlife Research Center, Maryland.

Sample collection and processing

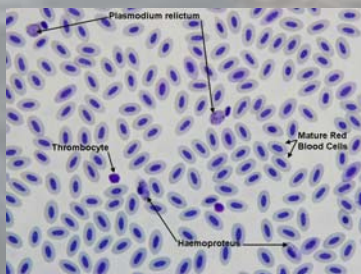
- The captive diving ducks were sampled for blood values on 4 different occasions covering the seasonal periods of spring migration, breeding, post-breeding, and fall migration (April-November).
- Blood was collected from each duck by jugular venipuncture and blood smears were made.
- Blood values obtained: packed cell volume (PCV), total solids (TS), red blood cell count (RBC), mean corpuscular volume (MCV), hemoglobin (Hgb), white blood cell count (WBC), monocytes, lymphocytes, heterophils, eosinophils, basophils, and haemosporidian (*Plasmodium* and *Haemoproteus*) prevalence.
- SAS was used to compare the intraspecific values between the sexes, across the seasons, and the overall effect of haemosporidians on the blood parameters.



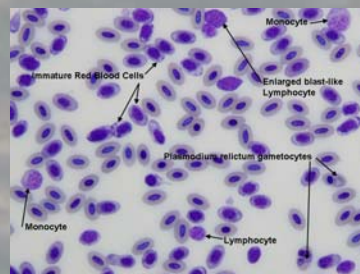
Seasonal means for packed cell volume (PCV), one of the 11 blood parameters examined. There was a significant difference between male and female lesser scaup during the breeding season ($P < 0.0001$) and there were intraspecific significant differences across the seasons for all species ($P = 0.001 - 0.049$). *Plasmodium* had a significant effect on long-tailed duck ($P = 0.008$) and white-winged scoter ($P = 0.002$) PCV values. The effect of *Haemoproteus* was not significant on the PCV values for any of the four species ($P = 0.059 - 0.705$).

	Spring	Refractile Heterophils Breeding	Post-breed	Fall	Blast-Like Thrombocytes and Lymphocytes Spring	Post-breed	Fall
Long-tailed Duck (<i>Clangula hyemalis</i>)							
Females	80%	100%	80%	20%	0%	0%	60%
Males	57%	86%	43%	29%	0%	0%	43%
Surf Scoter (<i>Melanitta perspicillata</i>)							
Females	50%	100%	50%	25%	0%	0%	0%
Males	40%	100%	86%	20%	0%	0%	0%
White-winged Scoter (<i>Melanitta fusca</i>)							
Females	100%	88%	50%	75%	14%	0%	13%
Males	90%	100%	70%	90%	0%	10%	40%
Lesser Scaup (<i>Aythya affinis</i>)							
Females	0%	0%	0%	0%	9%	0%	18%
Males	0%	8%	0%	0%	8%	0%	16%

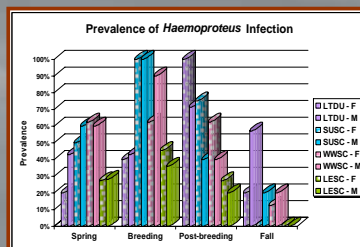
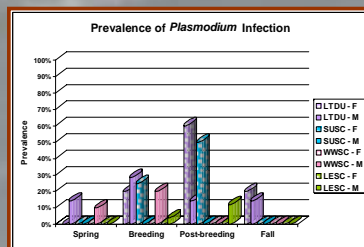
Summary of blast-like thrombocytes and lymphocytes and refractile heterophils



Plasmodium and *Haemoproteus* parasitism, April (Long-tailed duck #575)



Increased leukocytes and immature red blood cells, June (Long-tailed duck #575)



Prevalence of *Plasmodium* and *Haemoproteus* across four seasons of the diving ducks' annual life cycle

RESULTS

- Seasonal trends were evident and intraspecific variations existed in seasonal means between the sexes.
- The occurrence of haemosporidians had a significant effect on some of the parameters.
- The effect of *Plasmodium* was significant for 55% of long-tailed duck parameters; the effect of *Haemoproteus* was significant for 36% of lesser scaup parameters.
- There were more infections by *Haemoproteus* than *Plasmodium*.
- Enlarged blast-like thrombocytes and lymphocytes, and refractile heterophils were present, primarily in the fall migration period.

CONCLUSION

- Differences in blood values could be attributed to season, sex hormones, physiology, and chronic haemoparasites.
- Data can serve as a reference for free-ranging seaducks and lesser scaup during periods of spring migration through fall migration.

ACKNOWLEDGEMENTS

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REFERENCES

Kocan 1972. J Wildl Dis. 8:115-118.
Shave and Howard 1976. J Wildl Dis. 12:195-201.

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USGS-PWRC Seaduck Team and volunteers sampling for blood values during four seasonal periods in diving ducks' annual life cycle (spring, breeding, post-breeding, and fall).