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Blood components and properties of Common Myna (*Acridotheres tristis*)

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Abstract-The objective of the study was to determine some blood components and properties of common Myna (*Acridotheres tristis*). A total of twenty two birds were collected from Madhepura district of Bihar during 2014, in the different season i.e winter and summer. Blood samples (1.0 ml) were collected from the wing vein. The findings revealed that the average values of PCV, red cell count, white cell count, hemoglobin concentration and H/L ratio of common Myna male were 36.96%, 4.28 X 10^6/m, 23.52 X 10^3/ml, 9.94 mg/100gm and 0.38 respectively during Winter and 35.88%, 3.77X 10^6/m, 23.26X 103/m, 8.17 mg/100gm and 0.37 respectively during Summer, whereas the average value of common Myna female were 36.71%, 4.11 X 10^6/m, 23.57 X 10^3/ml, 9.80 mg/100gm and 0.39 respectively during Winter and 35.72%, 3.53X 10^6/m, 23.26X 10^3/m, 8.10 mg/100gm and 0.37 respectively during Summer. Protein, uric acid, cholesterol and lipid concentrations were 5.76, 5.11, 186 and 4.12 respectively during Winter and 5.29, 4.78, 212 and 3.81 mg/100gm respectively during Summer for common Myna male and 5.84, 5.12, 186 and 4.23 respectively during Winter and 5.40, 4.82, 217 and 3.89 mg/100gm respectively during Summer for common Myna female. Statistical analysis revealed Significant differences ($P<0.05$) in the average values due to sex and season.

Keywords : Common Myna, *Acridotheres tristis*, Blood components

INTRODUCTION

The common myna or Indian myna (*Acridotheres tristis*), is a member of the family Sturnidae (starlings and mynas). An omnivorous open woodland bird with a strong territorial instinct, the common myna has adapted extremely well to urban environments. The myna bird is about 23 cm long, about 110 gm in weight, a little smaller than a dove, bigger than a bulbul. The common myna's head and neck are black. The back and breast are brown. The head of the bird is well groomed. The beak, legs and skin patches behind the eyes are dark yellow and it has white tail tips. The sexes look alike. Common mynas begin nest building in late February and March. The nests in urban areas are often found in houses or buildings, attic, drain pipes, on top of windows. Twigs, grass and leaves are used to build the nests, as well as cellophane, string, paper and even snake skin. Snakeskin is draped around the nest to scare off enemies. Nests are sometimes built in trees, especially in coconut and date palms. Both male and female mynas help build the nest. When courting, the male brings nesting material and places it in front of the female, who adds it to the nest. Nests may be used more than once and new nests may be built on top of old ones. The mynas are aggressive in defending their nesting territory from

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other birds or predators. Egg-laying takes place between March and July. Each nest has two to five eggs, which are a blue to blue-green color. Both adults take turns to incubate, or sit over the eggs. The chicks hatch after 13 to 18 days. They are fed and brooded (protected in the nest) by both parents. They are fed insects and earthworms for the first ten to twelve days, and each chick must be fed as often as 15 times every hour. At about one month of age the young birds, called fledglings, are able to fly and are ready to leave the nest. They spend another month with the parents, being fed occasionally and learning to feed themselves. Breeding takes place during the spring and summer. Following copulation, the female lays eggs on a daily basis over a period of several days. If an egg is lost during this time, she will lay another to replace it. There are normally four or five eggs that are ovoid in shape and pale blue or occasionally white, and they commonly have a glossy appearance. The color of the eggs seems to have evolved through the relatively good visibility of blue at low light levels. The egg size is 26.5-34.5 mm in length and 20.0-22.5 mm in maximum diameter. Incubation periods may take thirteen to fourteen days, both parents share the responsibility of brooding the eggs, but the female spends more time incubating them than does the male, and is the only parent to do so at night when the male returns to the communal roost. The objective of the study was to determine some blood components and properties of native or common Myna (*Acridotheres tristis*).

MATERIALS AND METHODS

A total of twenty two individuals of common Myna (*Acridotheres tristis*) were collected from Madhepura District of Bihar 2014, in the month of Winter and Summer. The blood samples of 1.0 ml were collected from the wing vein. The blood was centrifuged for 5 min for separation of serum. The blood cellular components traits included in this study were packed cell volume (PCV) was determined according to Archer[1], red blood cell count (RBC) and leucocytes or white blood cell count (WBC) were determined according to Natt and Herrick[2], hemoglobin concentration (Hb) according to Varley *et al.3* Differential leucocytes count was determined using Wright-Giemsa stain[4] and heterophils to lymphocytes ratio (H/L) estimated according to Burton and Guion.[5] The plasma total proteins which was determined by using colorimetric method described by Gornall *et al.*[6], uric acid was determined according to Henry *et al.*[7], cholesterol was determined according to Franey and Elias[8] and plasma lipid was determined according to AOAC[9].

RESULTS AND DISCUSSION

The average values of PCV, red cell count, white cell count, hemoglobin concentration and H/L ratio of myna male were 36.96%, 4.28 X 10^6/m, 23.52 X 10^3/ml, 9.94 mg/100gm and 0.38 respectively during Winter and 35.88%, 3.77x 10^6/m, 23.26x 10^3/m, 8.17mg/100gm and 0.37respectively during Summer, whereas the average value of myna female were 36.71%, 4.11x 10^6/m, 23.57 X 10^3/ml, 9.80 mg/100gm and 0.39 respectively during Winter and 35.72%, 3.53x10^6/m, 23.26X 10^3/m, 8.10 mg/100gm and 0.37 respectively during Summer (Table 1).

The Protein, uric acid, cholesterol and lipid concentrations were 5.76, 5.11, 186 and 4.12 respectively during Winter and 5.29, 4.78, 212 and 3.81 mg/100gm respectively during Summer for myna male and 5.84, 5.12, 186 and 4.23 respectively during Winter and 5.40, 4.82, 217 and 3.89 mg/100gm respectively during Summer for myna female (Table 2).

The blood GOT, GPT and ALP activities due to sex and season. The average values of male were 92, 8.6 and 34.2 U/l respectively during Winter and were 99, 10.5 and 35.7 U/l respectively during Summer, whereas the average values of female were 95, 8.9 and 34.9 U/l respectively during Winter and were 105, 10.8 and 36.9 U/l respectively during Summer (Table 3).

It is well known that hematological parameters in birds vary due to sex, season, time of sampling and according to some authors, even due to nutrition.[10] We found most of the differences between males and females in all parameters related to red blood cells (PCV, RBC and Hb). Males showed significantly higher values than females in most parameters, which conforms to similar findings in many avian species.[11] We assumed that the reason for the difference is a higher level of estrogens in blood of female birds, which reduces the values of red blood cell count. At the same time an opposite effect is caused by testosterone in males[12], also the significantly increased of cellular blood parameters in males occurred during the period of growth and decreased during the period of reproductive activity.[13]

Table 1. Blood cellular components of myna

Season	Sex	PCV (%)	RBC (X 10^6/ml)	WBC (X 10^3/ml)	Hb (gm/100ml)	H/L Ratio
Winter	Males	36.96 ±1.74	4.28 ±0.51	23.52 ±1.09	9.94 ±0.85	0.38 ±0.03
	Females	36.71 ±1.79	4.11 ±0.50	23.57 ±1.10	9.80 ±0.86	0.39 ±0.03
	Average	36.84 ±1.77	4.20 ±0.51	23.55 ±1.10	9.86 ±0.84	0.38 ±0.02
Summer	Males	35.88 ±1.71	3.77 ±0.52	23.26 ±1.08	8.17 ±0.86	0.37 ±0.04
	Females	35.72 ±1.73	3.53 ±0.52	23.26 ±1.10	8.10 ±0.87	0.37 ±0.05
	Average	35.75 ±1.75	3.65 ±0.51	23.26 ±1.10	8.14 ±0.87	0.37 ±0.04

Table 2. Blood serum biochemical properties of myna

Season	Sex	Protein (mg/100gm)	Uric acid (mg/100gm)	Cholesterol (mg/100gm)	Lipid (mg/100gm)
Winter	Males	5.76 ±0.37	5.11 ±0.44	186 ±1.62	4.12 ±0.40
	Females	5.84 ±0.33	5.12 ±0.46	180 ±1.69	4.23 ±0.41
	Average	5.80 ±0.34	5.12 ±0.45	183 ±1.64	4.18 ±0.40
Summer	Males	5.29 ±0.35	4.78 ±0.46	212 ±1.67	3.81 ±0.42
	Females	5.40 ±0.36	4.82 ±0.44	217 ±1.66	3.89 ±0.42
	Average	5.35 ±0.34	4.80 ±0.45	215 ±1.68	3.85 ±0.41

Table 3. Blood serum enzymes activity of myna

Season	Sex	GOT (U/I)	GPT (U/I)	ALP (U/I)
Winter	Males	92 ±1.34	8.6 ±0.56	34.2 ±1.11
	Females	95 ±1.37	8.9 ±0.52	34.9 ±1.17
	Average	94 ±1.37	8.8 ±0.54	34.5 ±1.16
Summer	Males	99 ±1.35	10.5 ±0.55	35.7 ±1.15
	Females	105 ±1.32	10.8 ±0.54	36.9 ±1.15
	Average	102 ±1.35	10.7 ±0.43	36.3 ±1.16

The values were in agreement with the findings of Pampori and Saleem[14] and Mary and Gomathy[15]. Numerically lower blood cellular components and properties during summer in the present study may be due to the hot temperature in summer compared with Low temperature during Winter. This might have resulted in changes in blood volume due to hemodilution in Summer and low blood viscosity.[16]

Serum transaminase enzymes of glutamicoxaloacetic acid transaminase (GOT), which also called Aspartate aminotransferase (AST) and glutamic-pyruvic acid transaminase (GPT) are type of enzymes that help produce chemical reactions in the body. It is found mainly in the blood but also in certain body tissues, especially the heart and the liver. Alkaline phosphatase (AP) is present in nearly all tissues and organs, in particular liver and in bones, where it is associated with osteoblastic processes. In avian and poultry, females have consistently higher values for GOT, GPT and AP compared to males.[17]

All heat-stressed birds displayed systemic inflammation and activated biochemical markers included increased plasma levels of blood glutamic oxaloacetic transaminase, glutamic pyruvic transaminase and alkaline phosphatase; increased levels of glutamate, glycerol and lactate/pyruvate ratio; and decreased striatal levels of partial pressure of oxygen and local cerebral blood flow, which were all observed during heat stress.[18] High environmental temperature, causing hyperthermia, leads to a sequence of physiological and metabolic changes resulting from the need to cool the body temperature or a sequence of metabolic events originated from the hyperthermia. In the birds, as well as other animals, one way of cooling the body is accomplished by panting and evaporative cooling, with eventual loss of carbon dioxide and development of respiratory alkalosis.[19]

The increased activities in renal enzymes, following a long-term hyperthermia, include alkaline phosphatase, probably because of having an important role in the kidney

function. This change could be associated with the increased of metabolic activities required to adjust blood pH, compensating and neutralizing the developing respiratory alkalosis caused by panting and hyperventilation in the process of cooling the body.[20]

REFERENCES

1. **Archer, R K. 1965.** Hematological techniques for use on animals. Black Well Scientific Publications, Oxford.
2. **Natt M P, Herrick C A. 1952.** *Poultry Sci.* **31:**735-738.
3. **Varley H, Gowenlock A H, Bell M. 1980.** Practical Clinical Biochemistry. 5th ed., William. Heinemann Medical Books Ltd., London.
4. **Shen P F Patterson L T. 1983.** *Poultry Sci.* **62:** 923-924.
5. **Burton R R, Guion C W. 1968.** *Poultry Sci*. **47:** 1945-1949.
6. **Gornall A C, Bardwill C J, David M M, J. 1949.** *Biol. Chem*., **177:** 751.
7. **Henry R J, Sobel C, and Kim J. 1982.** Determination of uric acid. Saunders W B, Company, London.
8. **Franey R J, Elias A. 1968. Clin.** *Chem. Acta*. **2:** 255-263.
9. **AOAC. 1980.** Official Methods of Analysis. 13th ed., Association of Official Analytical Chemists, Washington.
10. **SAS Institute. 2001.** SAS/STAT User's Guide for Personal Computer. Release 6.12 SAS Institute, INC., Cary, N.C., USA.
11. **Steel R G, Torrie J H. 1980.** Principle and Procedures of Statistics. 2nd ed., McGrow-Hill Book Co., Inc, New York, USA.
12. **Fudge A M. 2000.** Laboratory Medicine. Saunders W B, Company, Philadelphia.
13. **Al-Obaidi F A. April 14-15th 2015.** Proceeding of the 3rd International Scientific Conference of Genetic and Environment, Baghdad. 526-530pp.
14. **Itoh N, J. 1992.** *Rakuno Gakuen University*. **17:** 61-64.
15. **Hauptmanova K, Maly M, Literak I. 2006.** *Vet. Med*. **51(1):** 29-34.
16. **Pampori ZA, SaleemIqbal K. 2007.** *Int. J. Poult. Sci.* **6:** 578.
17. **Mary P, Gomathy V S, Tamilnadu J. 2008.** *Vet. Anim. Sci.* **4:** 60-66.
18. **Pandian C, Thangapandiyan M, Omprakash AV, Thyagarajan D, Babu M, Tamilnadu J. 2012.** *Vet. Anim. Sci.* **8(6):**389-392.
19. **Al-Obaidi F A, Al-Shadeedi S M J. 2011.** *Res. Opin. Anim. Vet. Sci.* **1(3):**130-132.
20. **Chen C M, Hou C C, Cheng K C, Tian, R L, Chang C P Lin M T. 2006.** *Care Med.* **34(7):** 1960-1966.

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