



P-ISSN: 2349-8528
 E-ISSN: 2321-4902
 IJCS 2018; 6(6): 82-84
 © 2018 IJCS
 Received: 18-09-2018
 Accepted: 19-10-2018

Dr. L Inaotombi Devi
 Regional Institute of
 Paramedical and Nursing
 Sciences, Zemabawk, Aizawl,
 Mizoram, India

Dr. Lalnunluangi Hmar
 College of Veterinary Sciences &
 Animal Husbandry, Central
 Agricultural University
 Selesih, Aizawl, Mizoram, India

Dr. M Ayub Ali
 College of Veterinary Sciences &
 Animal Husbandry, Central
 Agricultural University
 Selesih, Aizawl, Mizoram, India

Dr. Saidur Rahman
 College of Veterinary Sciences &
 Animal Husbandry, Central
 Agricultural University
 Selesih, Aizawl, Mizoram, India

Dr. Prava Mayengbam
 College of Veterinary Sciences &
 Animal Husbandry, Central
 Agricultural University
 Selesih, Aizawl, Mizoram, India

Dr. Hemen Das
 College of Veterinary Sciences &
 Animal Husbandry, Central
 Agricultural University
 Selesih, Aizawl, Mizoram, India

Correspondence

Dr. L Inaotombi Devi
 Regional Institute of
 Paramedical and Nursing
 Sciences, Zemabawk, Aizawl,
 Mizoram, India

Serum biochemical profile of Japanese quails (*Coturnix coturnix japonica*) under agro climatic conditions of Mizoram

**Dr. L Inaotombi Devi, Dr. Lalnunluangi Hmar, Dr. M Ayub Ali,
 Dr. Saidur Rahman, Dr. Prava Mayengbam and Dr. Hemen Das**

Abstract

Japanese quail farming is rapidly gaining popular for its commercial exploitation and in near future may acquire an important segment in rapidly expanding Indian poultry industry. The blood biochemical analysis of livestock and poultry is a valuable tool for evaluating the health of animal and helps both in diagnosis and clinical monitoring of disease. In the present investigation the plasma levels of glucose, total cholesterol, triglyceride, HDL-cholesterol, total protein, albumin, globulin, A:G ratio, blood urea nitrogen, uric acid, creatinine, direct and total bilirubin were estimated in adult Japanese quails reared under Agro Climatic conditions of Mizoram to generate a baseline data. The observed plasma levels were glucose - 334.00 ± 8.41 mg/dl, total cholesterol - 199.25 ± 17.55 mg/dl, triglyceride - 192.50 ± 55.59 mg/dl, HDL- 110 mg/dl, total protein - 3.45 ± 0.37 g/dl, albumin - 0.85 ± 0.10 g/dl, globulin - 2.60 ± 2.18 g/dl, A: G ratio 0.30, uric acid - 7.35 ± 6.17 mg/dl, blood urea nitrogen (BUN) - 2.13 ± 0.29 mg/dl, creatinine - 0.40 ± 0.08 , direct bilirubin - 0.10 mg/dl and total bilirubin was 0.33 ± 0.09 mg/dl.

Keywords: Plasma biochemical profile, Japanese quails, agro climatic conditions of Mizoram

Introduction

Poultry industry forms a major portion of the agriculture sector in developing countries including India. During the last two-three decades, India has a remarkable growth in poultry industry. Quail farming is cropping up as a new venture of diversification of poultry farming to diverse the choice of taste and to strengthen the meat production unit for fulfilling the shortage of animal protein demands. Quails possess an excellent disease resistance quality than those of chickens and have been chosen for its economical viability in farming. Japanese quails are rapidly gaining popularity for its commercial exploitation and in near future may acquire an important segment in rapidly expanding Indian poultry industry (Deka and Borah, 2008) [1]. Japanese quails are hardy birds that thrive in small cages, have less feed requirement compared to chicken (Ani *et al.*, 2009) [2]. Other unique characteristics and advantages of quails over other species of poultry include early attainment of sexual maturity, being able to come to lay eggs as early as 5-6 weeks of age, having short generation interval making it possible to have many generations in a year (Robbins, 1981, Annon, 1991) [3, 4], high rate of egg production (Garwood and Diehl, 1987) [5], high quality of protein, high biological value and low caloric content of the meat and eggs (Haruna *et al.*, 1997, Olubamiwa *et al.*, 1999) [6, 7].

The blood biochemical analysis is a valuable tool for evaluating the health of animal and helps both in diagnosis and clinical monitoring of disease (Karesh *et al.*, 1997) [8]. Serum biochemical profiling has been used in several species of domestic livestock to monitor herd health and to detect subclinical disease. Application of this technique to commercially raised poultry flocks has been limited by a lack of suitable reference ranges for most of the parameters being tested although much work has been done on specific individual parameters. In addition, much of the information that is available is based on small sample numbers, limited parameters and often outdated analytical techniques. Nonspecific "avian" values are not adequate because hematological and biochemical status is a reflection of many factors such as sex, age, breed, diet, management and stress level. The primary objective of the present investigation is to evaluate the plasma biochemical profile of Japanese quails reared under Agro climatic condition of Mizoram to generate a base line data.

Materials and Method

The research work of the present investigation was conducted at the Department of Veterinary Physiology & Biochemistry, College of Veterinary Sciences & A.H., Central Agricultural University, Selesih, Aizawl, Mizoram, India in the month of September- October, 2017. The birds, Japanese quails (*Coturnix coturnix japonica*) were reared under deep litter system and feed and water were provided *ad libitum*. The birds were slaughtered for blood collection by severing the jugular vein and the blood samples were collected in heparinized tubes. The blood samples were centrifuge at 3700 rpm for 10 min in a table top centrifuge machine (Hermle-Z326K, Germany) and the plasma was collected for analysis of biochemical profile. The biochemical profile of the samples was analyzed in a Dry Clinical analyzer (FujiFilm Dry Chem 4000i, Japan). The biochemical profile analyzed were glucose, total cholesterol, triglyceride, HDL-Cholesterol, total protein, albumin, globulin, A:G ratio, uric acid (UA), blood urea nitrogen (BUN), creatinine, direct bilirubin and total bilirubin. The results were then analyzed statistically using suitable statistical method as per Snedecor and Cochran (1994) [9].

Result and Discussion

The blood (plasma) biochemical profile of adult male Japanese Quails (*Coturnix coturnix japonica*) reared under Agro Climatic conditions of Mizoram, India were analyzed using Dry Clinical analyzer (FujiFilm Dry Chem 4000i, Japan). The result of biochemical estimation is given in Table 1. The observed plasma glucose level was 334.00±8.41 mg/dl and the value ranges between 325.00-345.00 mg/dl. The observed value in this investigation is within the values reported in literature. Krupakaran (2013) [10] reported a value of 450±21.04 mg/dl while Kabir (2013) [11] reported a value of 193±4.42 however the observed value is almost comparable with the value reported by Ali *et al.* (2012) [12]. Ali *et al.* (2012) [12] reported a value of 395.47±6.6 mg/dl at 7th week of age of the birds.

Table 1: Plasma Biochemical Profile of adult male Japanese Quails (*Coturnix coturnix japonica*).

Sl. No.	Parameters	Average	Range
01	Glucose (mg/dl)	334.00±8.41	35.00-345.00
02	Total Cholesterol (mg/dl)	199.50±17.55	186.00-225.00
03	Triglyceride (mg/dl)	192.50±55.59	153.00-273.00
04	HDL-Cholesterol (mg/dl)	110.00±0.00	110.00
05	Total Protein (gm/dl)	3.45±0.37	3.20-4.00
06	Albumin (gm/dl)	0.85±0.10	0.80-1.00
07	Globulin (mg/dl)	2.60±2.18	2.40-3.00
08	A:G ratio	0.30±0.00	0.30
09	Uric acid (mg/dl)	7.35±6.17	4.00-16.60
10	BUN (mg/dl)	2.13±0.29	2.00-2.50
11	Creatinine (mg/dl)	0.4±0.08	0.30-0.50
12	Direct Bilirubin (mg/dl)	0.10±0.00	0.10
13	Total Bilirubin (mg/dl)	0.33±0.09	0.20-0.40

The total cholesterol, triglyceride and HDL-Cholesterol observed were respectively 199.25±17.55 mg/dl, 192.50±55.59 mg/dl and 110 mg/dl and the values ranges between 186.00-225.00 mg/dl, 153.00-273.00 mg/dl for total cholesterol and triglyceride respectively. The total cholesterol estimated is somewhat higher than the values reported in literature. Krupakaran (2013) [10] reported a value of 105±4.45 mg/dl. Kabir (2013) reported a value of 144±2.58 mg/dl while Agina *et al.* (2017) [13] reported a mean value of 78.57±2.95 mg/dl for adult male Japanese quails. The values observed for

triglyceride and HDL Cholesterol cannot be compared with other values as we have not come across any report on these parameters for Japanese quails. The total protein value observed was 3.45±0.37 g/dl and the value ranges between 3.20 and 4.00 g/dl while the observed value of albumin was 0.85±0.10 g/dl and the value ranges between 0.80 and 1.00 g/dl. The plasma globulin value calculated was 2.60±2.18 g/dl and the value ranges between 2.40 and 3.00 g/dl. The A: G ratio calculated was 0.30. The total protein observed in the present investigation is comparable with the values reported in literature. Ali *et al.* (2011) [15] reported a value of 3.33±0.52 g/dl while Krupakaran (2013) [10], Kabir (2013) [11], Sokol *et al.* (2015) [14] and Agina *et al.* (2017) [13] reported values of 3.75±0.2 g/dl, 30464±238.50 mg/dl, 3.72±4.56 g/dl and 3.42±0.05 mg/dl respectively. The observed albumin level, 0.85±0.10 g/dl, in this investigation is lower than the values reported by other workers. Agina *et al.* (2017) [13], Sokol *et al.* (2015) [14], Krupakaran (2013) [10], Kabir (2013) [11] and Ali *et al.* (2011) [15] reported the level of 1.64±0.00 mg/dl, 1.55±1.94 g/dl, 1.29±0.01 g/dl, 1.55±1.41 g/dl and 1.96±0.51 g/dl respectively for Japanese Quails. The uric acid observed was 7.35±6.17 mg/dl and the value ranges between 4.00 and 16.60 mg/dl. The observed value is in agreement with the level reported by Krupakaran (2013) [10] and Ali *et al.* (2012). [12] Krupakaran (2013) [10] reported a mean value of 8.31 mg/dl while Ali *et al.* (2012) [12] reported a mean value of 7.41±0.28 mg/dl for Japanese quails at 7th weeks of age however, the observed value is higher than the reported value of 5.66±0.41 mg/dl for adult male Japanese quails by Agina *et al.* (2017) [13]. The observed blood urea nitrogen (BUN) was 2.13±0.29 mg/dl and value ranges between 2.00 and 2.5 mg/dl. The plasma creatinine estimated was 0.40±0.08 and the value ranges between 0.30 and 0.50 mg/dl. The creatinine level estimated is in agreement with the level of creatinine reported, 0.41 mg/dl, for adult male quails (Agina *et al.*, 2017) [13]. The plasma direct bilirubin was 0.10 mg/dl while the total bilirubin was 0.33±0.09 and the value ranges between 0.20 and 0.40 mg/dl.

Acknowledgement

The authors are very grateful to the Dean, College of Veterinary Sciences & Animal Husbandry, Central Agricultural University, Selesih, Aizawl for providing all the necessary facilities required to conduct the present investigation.

References

- Deka K, Borah J. Haematological and biochemical changes in Japanese Quails, *Coturnix coturnix japonical* and chickens due to *Ascaridia galli* infection. Int. J Poul. Sci. 2008; 7(7):704-710.
- Ani AO, Okeke GC, Emeh MB. Response of growing Japanese quail (*Coturnix coturnix japonical*) chicks to diets containing different energy and protein levels. Proceedings of the 34th Annual Conference Nigeria Society for Animal Production, 15th – 18th March, Uyo, 2009, 328-331.
- Robbins GES. Quails, their breeding and management. Publisher- World Pheasant Association (WPA), 1981, 9-10.
- Annon L. Little known animals with promising economic future (micro-livestock). Board of Science and Technology for International Development. National Academy Press, Washington DC, 1991, 147-155.

5. Garwood AA. Body volume and density of live *Coturnix* quail and associated genetic relationship. *Poultry Science*, 1987; 66(8):1269.
6. Haruna ES, Musa U, Lombin LH, Tat PB, Shamaki D, Okewole P *et al.* Introduction of quail production in Nigeria. *Nigerian Veterinary Journal*. 1997; 18:104-107.
7. Olubamiwa O, Haruna ES, Musa U, Akinwole TO, Combin LH, Longe GO. Effects of different energy levels and cocoa based diets on the productive performance of Japanese quail. *Nigerian Journal of Animal Production*. 1999; 26:88-92.
8. Karesh WB, Campo AD, Braselton E, Puche H, Coe RA. Health evaluation of free ranging and hand reared macaws (*Ara spp*) in Peru. *Journal of Zoo and Wild Life Medicine*. 1997; 28:368-377.
9. Snedecor GW, Cochran WG. *Statistical Method*. 8th Edn. Oxford and IBH Publishing Co., New Delhi, 1989.
10. Krupakaran RP. Serum Biochemical profile of Japanese Quails (*Coturnix coturnix japonica*). *Indian Journal of Fundamental and Applied Life Sciences*. 2013; 3(1):182-183.
11. Kabir MA. Blood chemistry analyses of Japanese Quail (*Coturnix coturnix japonica*). *Scholarly Journal of Agricultural Science*. 2013; 3(4):132-136.
12. Ali MA, Hmar L, Devi LI, Prava M, Lallianchhunga MC, Tolengkomba TC. Effect of age on the haematological and biochemical profile of Japanese quails (*Coturnix coturnix japonica*). *Int. Multidisciplinery Res. Journal*. 2012; 2(8):32-36.
13. Agina OA, Ezema WS, Iwuoha EM. The haematology and serum biochemistry profile of adult Japanese quail (*Coturnix coturnix japonica*). *Notulae Scientia Biologicae*. 2017; 9(1):67-72.
14. Sokol R, Gesek M, Ras-Norynska M, Michalezyk M, Koziatek S. Biochemical parameters in Japanese Quails *Coturnix coturnix japonica* infected with coccidian and treated with Toltrazuril. *Journal of Veterinary Sciences*. 2015; 18(1):79-82.
15. Ali MA, Hmar L, Lalliankimi H, Chanu KV, Patra G, Devi LI. Effect of zinc supplementation on serum biochemical profile of Japanese Quails (*Coturnix coturnix japonica*). *Indian J Vet. Res.* 2011; 20(2):24-28.