***ACKNOWLEDGEMENT***

*All the praises and deepest sense of gratefulness belongs to the Almighty GOD, the Merciful, the omnipotent, and the Beneficent but the supreme Ruler of the Universe Who enabled me to complete my work successfully for the Internship program.*

*The author gratefully express first and foremost her heartiest appreciation, deepest sense of gratitude and best regards to her internship supervisor,* ***Dr. Subrata Kumar Shil****, Lecturer, Department of Anatomy and Histology, Chittagong Veterinary and Animal Sciences University, Khulshi, Chittagong-4225, for his advice, encouragement, constructive criticism, scholastic supervision and intellectual guidance throughout this research.*

*The author deems it a proud privilege to acknowledge her gratefulness, heartfelt gratitude and best regards to* ***Professor Dr. Md. Abul Quasem,*** *Head, Department of Anatomy and Histology, Chittagong Veterinary and Animal Sciences University, Khulshi, Chittagong for his continuous inspiration, constant valuable suggestions and instructions and preparation of this manuscript.*

*The author express her profound gratitude, gratefulness and heartfelt thanks to internship coordinator* ***Dr. Bibek Chandra Sutradhar****, Associate Professor, Department of Medicine and Surgery*, *Chittagong Veterinary and Animal Sciences University, Khulshi, Chittagong for their factual advice, kind cooperation and continuous encouragement during the study.*

*The author would like to thanks to the laboratory technician, staffs and the personnel of the Dept. of Anatomy and Histology, Chittagong Veterinary and Animal Sciences University (CVASU), for their assistance in conducting laboratory examination of samples.*

*The author is immensely grateful to her friends and well wishers, although it is not possible to mention every one by name.*

*-------------------*

*Author*

*June 13, 2013*

**CONTENTS**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Title** | |  | | | | | | **Page** | |
| **ACKNOWLEDGEMENT** | | | | | | | | I | |
| **CONTENTS** | | | | | | | | ii-iii | |
| **LIST OF PHOTOGRAPHS** | | | | | | | | Iv | |
| **LIST OF ABBREVIATIONS** | | | | | | | | V | |
| **ABSTRACT** | | | | | | | | Vi | |
| **Chapter I** | | **INTRODUCTION** | | | | | | 1-2 | |
| **Chapter II** | | **REVIEW OF LITERATURE** | | | | | | 3-6 | |
|  | | 2.1. | | | | Japanese quail | | 3-4 | |
|  | | 2.2. | | | | Avian respiratory system | | 4-4 | |
|  | | 2.3. | | | | Air sacs of Japanese quails | | 4-5 | |
|  | | 2.4. | | | | Gas flow patterns in the respiratory system during breathing | | 5-5 | |
|  | | 2.5. | | | | Gas exchange in avian lung | | 5-6 | |
| **Chapter III** | | **MATERIALS AND METHODS** | | | | | | 7-9 | |
|  | | 3.1. | | | | Selection of study population | | 7-7 | |
|  | | 3.2 | | | | Source of Japanese Quail | | 7-7 | |
|  | | 3.3 | | | | Lab Preparation | | 7-8 | |
|  | 3.3.1 | | | Required Instruments | | 7-7 | |
| 3.3.2 | | | Required chemicals | | 7-8 | |
| 3.3.3 | | | Preparation of latex solution | | 8-8 | |
| 3.3.4 | | | Preparation of 30% KOH | | 8-8 | |
|  | | 3.4 | | | | Laboratory examination | | 8-8 | |
|  | | 3.4.1 | | Determination of live weight of bird | | 8-8 | |
| 3.4.2 | | Sacrifice of quail | | 8-8 | |
|  | | 3.5. | | | | Infusion of latex | | 8-8 | |
|  | | 3.6. | | | | Keeping the quail in deep fridge | | 8-8 | |
|  | | 3.7. | | | | Exposing the latex cast | | 8-8 | |
| **Chapter IV** | | **RESULTS** | | | | | | 10-13 | |
|  | | 4.1 The lungs | | | | | | 10-10 | |
|  | | 4.2 | | | The air sacs | | | 10-13 | |
|  | | 4.2.1 | | | The cervical sac | | | 10-10 | |
|  | | 4.2.2 | | | The clavicular sac | | | 10-11 | |
|  | | 4.2.3 | | | The cranial thoracic sac | | | 11-11 | |
|  | | 4.2.4  4.2.5 | | | The caudal thoracic sac  The abdominal sac | | | 11-11  11-12 | |
| **Chapter V** | | **DISCUSSION** | | | | | | 14-15 | |
| **Chapter VI** | | **CONCLUSION** | | | | | | 16-16 | |
|  | | **RECOMMENDATIONS** | | | | | | 17-17 | |
|  | | **LIMITATIONS** | | | | | | 18-18 | |
|  | | **BIBLIOGRAPHY** | | | | | | 19-22 | |

**LIST OF PHOTOGRAPHS**

|  |  |  |
| --- | --- | --- |
| **Serial No.** | **Title** | **Page** |
| Photograph 3.1 | Adult Japanese quail | 9-9 |
| Photograph 3.2 | Preparation of latex | 9-9 |
| Photograph 3.3 | Infusion of Latex into the lung through trachea | 9-9 |
| Photograph 4.1 | Dorsal view of latex cast | 12-12 |
| Photograph 4.2 | Left lateral view of latex cast | 12-12 |
| Photograph 4.3 | Ventral view of latex cast | 13-13 |
| Photograph 4.4 | Right lateral view of latex cast | 13-13 |

**LIST OF ABBREVIATIONS**

|  |  |
| --- | --- |
| **Abbreviations** | **Elaborations** |
| % | Percent |
| ° | Degree |
| °C | Degree Celcius |
| μm | Micrometre |
| BBS | Bangladesh Bureau of Statistics |
| cm | Centimetre |
| gm  KOH  Kg | Gram  Potassium hydroxide  Kilogram |
| m | Metre |
| mm | Mili metre |
| ml | Mili litre |
| PO2 | Partial pressure of oxygen |
| PCO2 | Partial pressure of carbon dioxide |
| SAE | Surface Area Available for Exchange |
| SPBB | Statistical Pocket Book of Bangladesh |

**ABSTRACT**

This study was conducted to reveal the gross morphological characteristics of the lung and air sacs in *Coturnix coturnix japonica* (Japanese quails) in anatomy laboratory of CVASU. The sacs of 10 birds were cast by injection of latex via the trachea and it stored in refrigerator for two months. Then it corroded with 30% KOH at 40°C for 24 hours. The lungs were located in the dorsal part of the thorax and very close to the thoracic vertebrae and ribs. Shorter than the dorsal border, the ventral border lied between the 3rd and 6th ribs. Cervical, clavicular, cranial thoracic, caudal thoracic and the abdominal sacs were identified. Cervical sacwas located on the left and right portions of the cervical and thoracic vertebrae with a pronounced communication ventromedially. The cervical sac aeration of only cervical vertebrae was present in this study. Humerus was a non aerated bone. Cranial thoracic sac connected to the 1st, 2nd and 4th medioventral bronchi and gave no diverticulum for aeration. Left and right abdominal sacs paramedially produced *diverticulum femorale,*but this diverticulum did not enter the femur.

**Key words:** Air sacs, japannese quails, gross morphology, lung