Macro anatomical study of appendicular skeleton of arm region of domestic duck (Anas platyrhynchos domesticus)

A Deka, Kabita Sarma and M Talukdar

Abstract
The present study was conducted on one pair of humerus. Humerus composed of two extremities and shaft. The two extremities were proximal and distal. The proximal extremities contained head, deltoid crest, medial tubercle, lateral tubercle and pneumatic foramen. The head was oval in shape. Deltoid crest was situated laterally and curved in backward direction. A large pneumatic foramen was situated immediately below the medial aspect of medial tubercle. Distal extremities contained medial and lateral condyle. Medial condyle was larger than lateral and it was traversed by grooved. The shaft consists of four surface viz., lateral, medial, cranial and caudal. Lateral surface was smooth and concave whereas medial surface was smooth and convex. The cranial surface was smooth and convex. The caudal surface was wide and concave above and convex below.

Keywords: Appendicular, skeleton, arm, domestic, duck

Introduction
The duck population of India is about 25.54 million (Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, 2014). Assam possesses the population with about 8.4 million (Basic Animal Husbandry Statistics, 2014) [1]. As such Assam is one of the major duck rearing state in India. Assam, one of the states in the North East and it possess second position in the Indian population (Islam et al., 2007) [2]. Humerus is a strong, largely pneumatic, tubular bone of duck. It maintains the balanced of the birds. This long bone has shaft and proximal as well as distal extremities. Since there is very scanty literature on the detailed anatomy of femur of domestic duck of Assam. Therefore, being a local variety of Assam the present study was designed to establish gross anatomical norms on the Humerus of domestic ducks of Assam.

Materials and Methods
The current study was conducted on one pair Humerus of a domestic duck (Anas platyrhynchos domesticus) of Assam. After slaughter, the skeleton of the duck was processed as per the method of Young (1980). The study period of present investigation was one month. Then the humerus was removed and gross anatomical studies were made on it.

Results and Discussions
The present study was conducted on one pair of humerus. The Humerus was large, strong, tubular and pneumatic bone. This finding was in accordance with the finding of Nickel et al., (1977) [3] in fowl and Pop and Pentea (2007) in ostrich. Humerus composed of two extremities and shaft. Similar observations were reported by Ali et al., (2016) [6] in avian. The two extremities were proximal and distal. The proximal extremities contained head, deltoid crest or pectoral crest, medial tubercle, lateral tubercle and pneumatic foramen (Fig.1). These findings were in agreement with the findings of Chamberlain (1943) [2] in chicken and Smith and Smith (1992) in great horn owl. The head was oval in shape. Deltoid crest was situated laterally and curved in backward direction. A large pneumatic foramen was situated immediately below the medial aspect of medial tubercle. The pneumatic foramen was present for the passes of the clavicular air sac. Similar finding was reported that by Feduccia (1975) [3] in Avian. Distal extremities contained medial and lateral condyle (Fig.2). Medial condyle was larger than lateral and it was traversed by grooved. The shaft consists of four surface viz., lateral, medial, cranial and caudal.
Cranial and caudal. Lateral surface was smooth and concave whereas medial surface was smooth and convex. The cranial surface was smooth and convex. The caudal surface was wide and concave above and convex below.

Fig 1: Photograph showing the head (A), pneumatic foramen (B), caudal surface (C) and olecranon fossa (D) of humerus of domestic duck (Anas platyrhynchos domesticus) of Assam.

Fig 2: Photograph showing the deltoid crest (A), Radial fossa (B), Medial condyle © and inter condyloid groove (D) of domestic duck (Anas platyrhynchos domesticus) of Assam

The length of the humerus, diameter of shaft of the humerus, diameter of the head of the humerus and length of the deltoid crest were 9.6cm, 2.6cm, 2.5cm and 2.4cm, respectively (Table.1).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of the Humerus</td>
<td>9.6cm</td>
</tr>
<tr>
<td>Diameter of shaft of Humerus</td>
<td>2.6cm</td>
</tr>
<tr>
<td>Diameter of the head of the Humerus</td>
<td>2.5cm</td>
</tr>
<tr>
<td>Length of the deltoid crest</td>
<td>2.4cm</td>
</tr>
</tbody>
</table>

Summary and conclusion
The proximal extremities of humerus of domestic duck of Assam composed of oval shaped head, deltoid crest, and pneumatic foramen. The shaft of the humerus of domestic duck of Assam consists of four surface viz., lateral, medial, cranial and caudal. Distal extremities contained medial and lateral condyle. Medial condyle was larger than lateral and it was traversed by grooved. These studies will help poultry scientist for effective production and disease control regime.

Acknowledgement
The author is grateful to the Dean, Faculty of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India to carry out the research.

References