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## Study on Some Body Organ Systems of the Wild African Senegal Parrot (*Poicephalus senegalus versteri*)

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**Abstract:** Parrot population in Africa is declining and the need for conservation actions to address threats is increasingly recognized. The situation is worst in Nigeria and if care is not taken, this species of bird will soon go into extinct. The essence of this study was to obtain a data base of some body organs of the wild Senegal parrot which are scarce. Documentation on this species of bird is rare despite they are being hunted for because of its demand as ornamental bird. The mean weights (whole body, gastrointestinal tract (GIT)+content and GIT empty) were observed to be 120.50±5.42, 18.01±4.80 and 13.54±5.51 g, respectively. The liver had mean weight of 4.18±1.82 while the tongue, lower respiratory system (LRS), heart and kidney were observed to be, 2.76±2.14 g, 5.83±1.65, 1.81±0.65 and 0.41±0.05 g. The mean length (whole body+tail) were observed to be 9.85±1.20 cm. The mean lengths (GIT, liver tongue and LRS) were 82.62±2.36, 4.33±1.82, 2.04±0.99 and 12.69±2.10 cm with GIT and LRS accounting for 76.93 and 19.97%. The syrinx is very large suggesting sound production is pronounced and the large intestine is void of cecum.

**Key words:** Body, organ system, wild, Senegal, parrot

### INTRODUCTION

Parrots are gregarious and vocal creatures that communicate in ways we have to understand. It can be quite fun trying to figure out why they do some of the things they do. Body language can reveal whether a pet bird is calm and content, fearful, aggressive, having fun, wanting attention or if it is displaying mating behavior (Athan and Deter, 2000). In the wild, Senegal Parrots are shy and avoid being approached. This behaviour has a tendency to remain, even in captivity, unless they are handled and socialized at an early age. Throughout their lives, they need human interaction, gentle handling and stimulation to remain tame and gentle.

Most parrots are quite entertaining in some of their more comical behaviours, such as rolling up in a cloth, lying on their back, or hanging and swinging upside down for extended periods. Although not great talkers (comparatively), they can and will learn to mimic and have a relatively quiet voice. Their antics, size and more reticent nature make the Senegal a good Parrot population in Africa is declining and the need for conservation actions to address threats is increasingly recognized. The situation is worst in Nigeria and if care is not taken, this species of bird will soon go into extinct, (Wright, 2002).

Effective conservation requires a robust knowledge base on which decisions over appropriate actions can be made, yet at present there is no current and readily accessible status of populations, the threats they face and knowledge in this species of bird IUCN (2000).

The essence of this study was to obtain a data base of some body organs of the wild Senegal parrot which are

scarcely found in Nigeria. Documentation on this species of bird is rare despite they are being hunted for because of its demand as ornamental bird. Parrots are kept in few private schools, institutes, zoos and some individual residential areas.

### MATERIALS AND METHODS

Three of these birds were caught around Shika village a small farmstead in Northern part of Kaduna State, Nigeria. This species of bird is rare in this part of the country, as such the reason for using the number stated above. Birds were transported in a standard laboratory cage to the animal units of the department of Veterinary anatomy, faculty of veterinary medicine, Ahmadu Bello University, Zaria. Grains, fried cake and water were given *ad libitum* for two and half weeks.

Birds were sacrificed, placed on dorsal recumbency and an incision was made from the level of the mandible, through the thorax to the anal region. The cervical, thoracic and abdominal portions of the esophagus were exposed. Weight of the bird was taken using Mettler balance of sensitivity of 0.001 g. ruler, scissor, digital vernier caliper, thread and digital camera, Sony, 12 mega Pixel, Made in China was used. Measurements were recorded in grams (weight) and centimeters (length).

**Statistical analysis:** Mean±Standard Error of Mean (Mean±SEM) using Statistical Package for Social Science Version (SPSS) 17 was used in finding values for weights and length.  $p < 0.05$  was considered significant.

## RESULTS

**Morphometric:** The mean weights (whole body, GIT+content and GIT empty) were observed to be  $120.50 \pm 5.42$ ,  $18.01 \pm 4.80$  and  $13.54 \pm 5.51$  g, respectively. The GIT and its content accounted for 14.94% of the total body weight. The liver had mean weight of  $4.18 \pm 1.82$  while the tongue, LRS, heart and kidney were observed to be,  $2.76 \pm 2.14$  g,  $5.83 \pm 1.65$ ,  $1.81 \pm 0.65$  and  $0.41 \pm 0.05$  g. The kidneys had the lowest percentage body weight of 0.34% against 1.50 and 2.29% for heart and LRS Table 1.

The mean length (whole body+tail) were observed to be  $9.85 \pm 1.20$  cm. The mean lengths (GIT, liver tongue and LRS) were  $82.62 \pm 2.36$ ,  $4.33 \pm 1.82$ ,  $2.04 \pm 0.99$  and  $12.69 \pm 2.10$  cm with GIT and LRS accounting for 76.93% and 19.97%. The right kidney had a mean length of  $0.61 \pm 0.16$  cm while the mean length of the heart was  $2.72 \pm 0.70$  cm and the right ureter was seen to be longer than the left side (Table 2).

**Gross:** The esophagus and trachea are hollow organs for conveying food and air into stomach, intestines and lungs, respectively. The trachea run caudoventral to the esophagus through the cervical region and bifurcates shortly into the thoracic inlet. The esophagus exit between the points of bifurcation of the bronchi. The syrinx is large and prominent with the lung appearing pink (Fig. 1). The proventriculus is dorsally covered by the lobes of the liver and caudally by the gizzard. The intestines form a mass of spiral loops on the right abdominal region, cranially bordered by lobes of the liver, lateral and medial by abdominal wall and gizzard, respectively. The gizzard and the intestines are covered by thin and transparent peritoneum (Fig. 2).

## DISCUSSION

From this study, the mean body weight was observed to be lower than that of the domestic pigeon and much lower than those of the helmeted guinea fowl (Ibe *et al.*, 2008; Wanmi, 2012). Abumandour (2013) reported that an adult falcon captured in the wild has a weight 150 g and the weight of different species of birds varies even within the same species. The mean weights of the GIT with its content and GIT without its content were observed to be  $18.01 \pm 4.80$  and  $13.54 \pm 5.51$  g accounted for 14.94 and 11.24%, respectively. The GIT in birds is made up of the esophagus, crop, stomach and intestines (Dyce and Sack, 2010). In this study, the wild Senegal parrot does not have cecum as part of the large intestine as such; it has colon, rectum and cloaca a common opening to both GIT and urogenital systems. The mean weight of the liver was higher of all other auxiliary digestive glands, higher than kidneys and tongue. This is in agreement with report on male African grass cutter where the liver was reported to have the highest mean value (Itopa *et al.*, 2012) and its value is

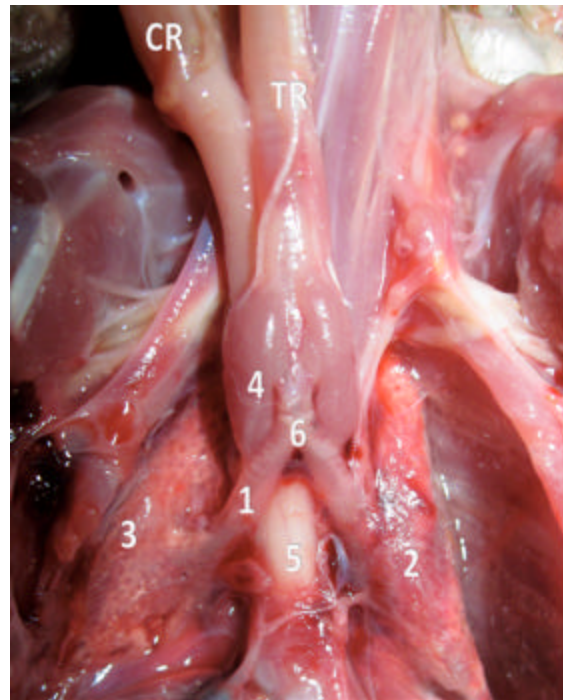


Fig. 1: Respiratory system showing, CR: Crop, TR: Trachea, 1: Bronchus, 2: Left lung, 3: Right lung, 4: Syrinx, 5: Esophagus and 6: Carina

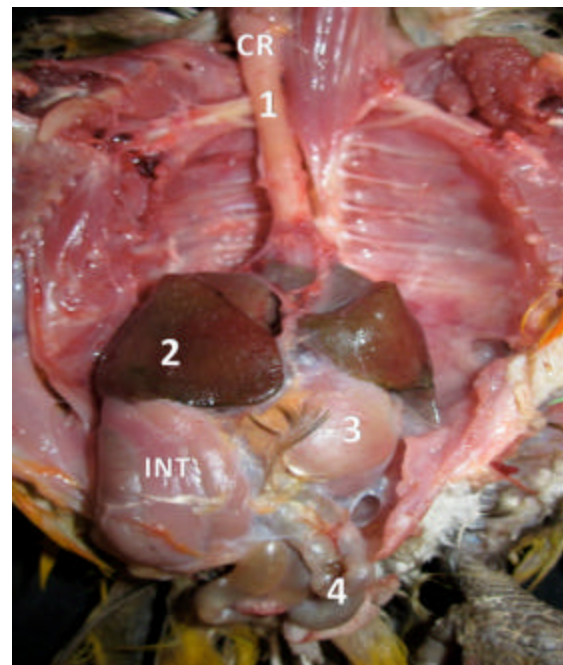


Fig. 2: Digestive system showing, CR: Crop, INT: Intestines, 1: Esophagus, 2: Liver, 3: Gizzard and 4: Small Intestine

Table 1: Morphometric features of the digestive system of the wild Senegal parrot. n = 3

Parameters: Weight (g)	Min. value	Max. value	Mean±SEM	Body weight (%)
Weight of whole body	110.89	129.65	120.50±5.42	
Weight of GIT+ Content	11.60	27.41	18.01±4.80	14.94
Weight of GIT empty	5.51	24.08	13.54±5.51	11.24
Weight of liver	1.38	7.60	4.18±1.82	3.47
Weight of tongue	0.48	1.93	2.76±2.14	2.29
Weight of the LRS	3.68	8.69	5.83±1.65	4.94
Weight of heart	1.01	3.10	1.81±0.65	1.50
Weight of kidneys	0.18	0.68	0.41±0.05	0.34

G: Gram, Mean±SEM: Standard error of mean

Table 2: Morphometric features of the digestive system of the wild Senegal parrot. n = 3

Parameters: Length (cm)	Min. value	Max. value	Mean±SEM	Body length (%)
Length of whole body+tail	12.53	17.02	9.85±1.20	
Length of GIT	76.13	95.01	82.62±2.36	76.93
Length of liver	1.93	7.91	4.33±1.82	
Length of tongue	0.81	4.02	2.04±0.99	3.27
Length of LRS	8.86	17.13	12.69±2.10	19.97
Length of heart	1.86	4.11	2.72±0.70	4.28
Length of left kidney	0.36	0.90	0.60±0.16	
Length of right kidney	0.37	0.91	0.61±0.16	
Length of left ureter	1.91	5.81	3.79±1.13	
Length of right ureter	1.97	6.01	3.89±1.17	

cm; centimeter, Mean±SEM: Standard error of mean

higher than other accessory organs of the body. The mean weights of the kidneys were lower than those of the Wister rat and African giant rat (Onyeausi *et al.*, 2009). The mean length of the whole body and tail were observed to be 9.85±1.20 cm and the GIT to be 82.64±2.36 cm. Nasrin *et al.* (2012) in their findings on the GIT of broilers postnatal, at day 28, reported a higher value for jejunum to be 123.50±3.663 cm, far much higher than adult wild Senegal parrot. The lengths of various segment of the intestine depend on the species of bird and their feeding habits (Ojo *et al.*, 1987). The mean length of the LRS was observed to be 12.69±2.10 cm which was higher than those values reported by Juliana *et al.* (2005) in partridge *Rhynchotus rufescens*. Hena *et al.* (2012) reported higher mean length values of 13.07±0.72 and 16.47±1.02 cm in the lower respiratory tract of the Japanese quail and pigeon, respectively. There is slight variation in the length of both ureters in the wild Senegal parrot. This agree with finding on the Wister where slight variations were obtained (Onyeausi *et al.*, 2009).

Grossly, the esophagus runs down midventral aspect of the cervical region through the thorax into the abdominal region. The digestive systems lie on the right abdominal region with the gizzard on the left abdominal region. This agree with the finding of Baumel and Witmer (1993) who reported that the stomach of chicken lie on the left mid line of the abdomen. In the South American catfish *Rhamdia quelen* fish, the digestive system is centrally located within the body (Hernandez *et al.*, 2009). In the wild Senegal parrot, the cecum is absent and it has been reported by other researchers in other birds.

**Conclusion:** This study was based on providing some basic morphologic data on the wild Senegal parrot

which documentation is scanty in this part of the country. The syrinx is grossly large and absent of the cecum may suggest that the bird may not be a strict granivores.

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